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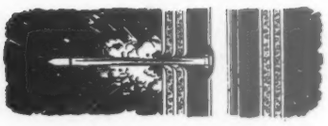

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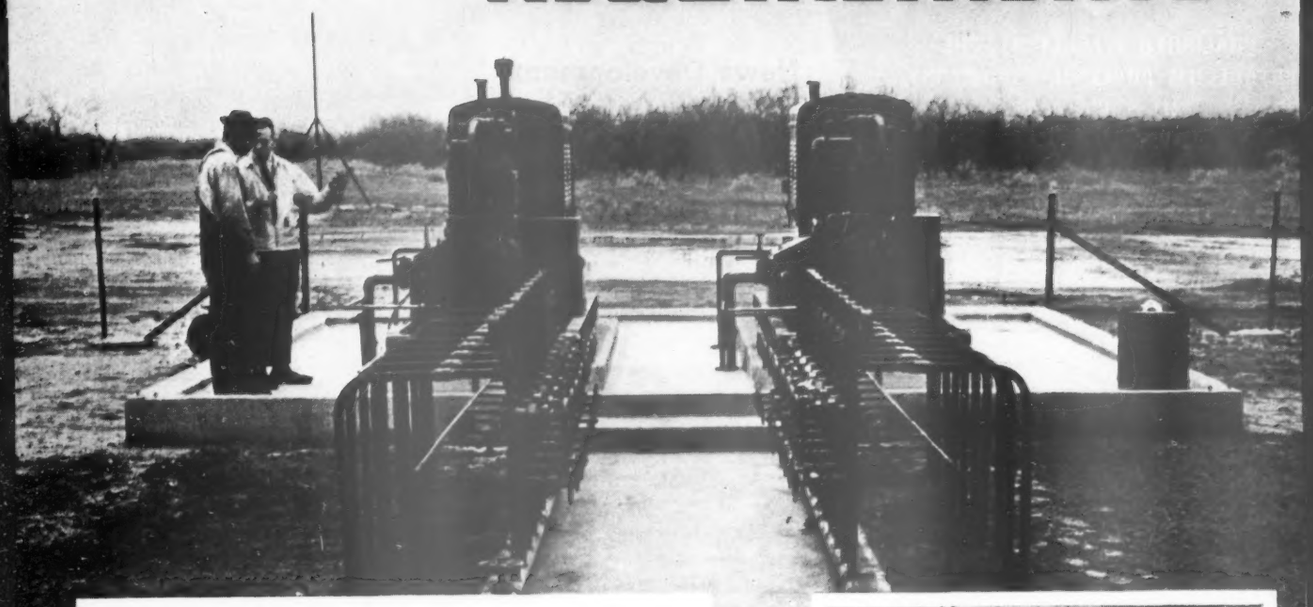
For PUMPING TODAY'S and Tomorrow's Emergency REQUIREMENTS



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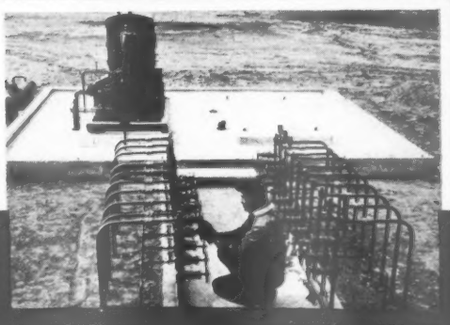

"Small picture shows lease partially on the pump with small horsepower requirements utilizing one triplex. Larger picture is of same lease after majority of wells were pumping, requiring additional horsepower and a second power unit."

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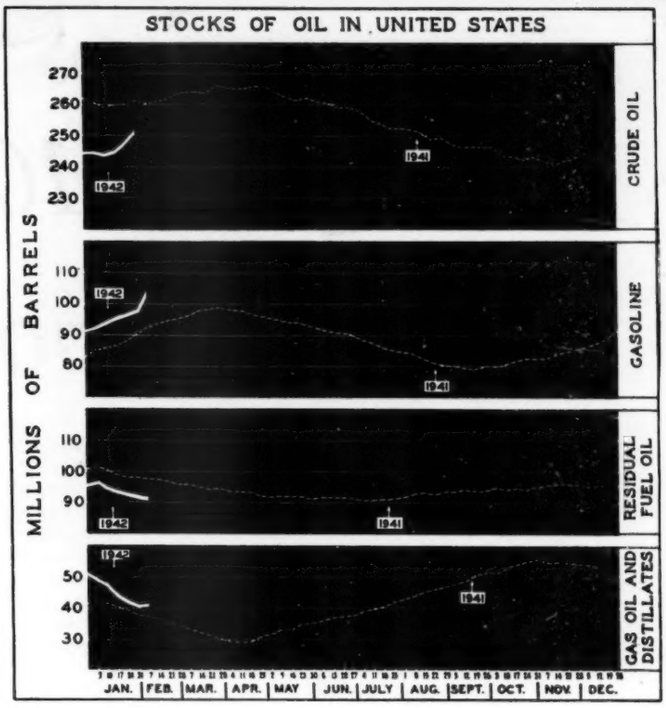
HYDRAULIC PUMPING SYSTEMS

Trends

Shortage of Tankers Becomes Controlling Factor in Operations



TRANSPORTATION bottlenecks are again affecting all divisions of the petroleum industry's operations. At the start of the week the tanker curtailment in the coastwise movement of petroleum products had brought proration in crude-oil purchases in one area; a threatened shortage of refined products in a large consuming section; excess supplies and lower prices at Gulf Coast points, and a 300-per cent increase in tank-car shipments to the Atlantic seaboard. A pooling program to expedite the transportation and distribution of crude oil and refinery products is under way under the direction of OPC and many fear that a rationing of gasoline and possibly other products is in prospect for the eastern part of the United States in the near future. The details of the week's developments are explained elsewhere in this issue.

CRUDE PRODUCTION *4,331,395 bbl. daily average — up 463,095 bbl. One year ago 3,369,740 bbl.*

CRUDE STOCKS *250,740,000 bbl. as of January 31—up 2,576,000 bbl. One year ago 261,270,000 bbl.*

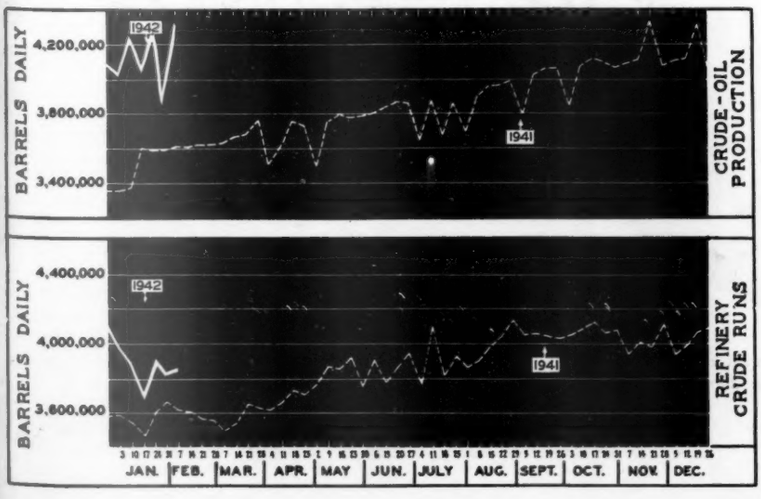
GASOLINE STOCKS *100,224,000 bbl. as of February 7 — up 2,414,000 bbl. One year ago 90,366,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *90,859,000 bbl. as of February 7 — down 330,000 bbl. One year ago 98,097,000 bbl.*

GAS OIL AND DISTILLATES *40,038,000 bbl. as of February 7—down 36,000 bbl. One year ago 37,938,000 bbl.*

REFINERY RUNS *3,853,000 bbl. daily week ended February 7—up 5,000 bbl. One year ago 3,660,000 bbl.*

Reports show that the industry is better prepared to cope with the tanker shortage than it was last summer when a similar situation developed as a result of the requisitioning of tankers for British use. Tank-car shipments to eastern points which had decreased to approximately 50,000 bbl. daily following the return of tankers last year jumped to 165,000 bbl. daily at the start of this month when the tanker shortage became more acute than it was any time last year. Shippers are also making full use of the limited pipe-line facilities connecting to Atlantic seaboard refineries. Reports the first of the week indicated that this new overland movement was not offsetting the decline in coastwise tanker shipments from the Gulf Coast. Estimates regarding the recent decline from the normal coastwise and export movement of crude oil and products range from 300,000 to 600,000 bbl. daily.



DAILY AVERAGE PRODUCTION FOR WEEK

	Feb. 7, 1942	Feb. OPC recommended production	February state allowables	Jan. 31, 1942
Arkansas	74,590	74,500	74,500	74,505
California	650,750	632,300	632,300	635,750
Eastern fields	110,450	111,400	.....	110,900
Illinois	371,045	371,800	.....	375,095
Kansas	246,700	251,700	251,700	251,200
Louisiana	364,550	335,000	344,955	366,805
North Louisiana	*80,700*	.....	.....	*81,005*
Louisiana Gulf Coast	*283,850*	.....	.....	*285,800*
Michigan	47,800	47,000	47,000	51,300
Mississippi	83,525	57,400	.....	79,705
Nebraska	5,125	5,200	.....	5,250
New Mexico	121,060	119,300	119,300	120,960
Oklahoma	408,200	395,300	395,300	408,850
Rocky Mountain states	116,200	104,900	.....	117,980
Texas	1,731,400	1,596,000	1,606,389	1,270,000
East Texas	*439,100*	.....	.....	*291,000*
West Texas	*353,400*	.....	.....	*242,450*
North Central Texas	*148,200*	.....	.....	*144,350*
East Central Texas	*95,750*	.....	.....	*80,000*
Texas Panhandle	*95,550*	.....	.....	*75,500*
Texas Gulf Coast	*489,300*	.....	.....	*352,300*
Southwest Texas	*110,100*	.....	.....	*84,400*
Total United States	4,331,395	4,101,800	.....	3,868,300
Total production, Jan. 1-Feb. 7, 1942			157,814,050 bbl.	
Same period last year			133,706,330 bbl.	

It is pointed out that these changes in transportation conditions will again strengthen the position of inland supplies. Oklahoma, Kansas and North Texas operators were of the opinion that outlets for their crude oil will expand. Excess pipe-line capacity is available from the Mid-Continent connecting to lines of the Middle West. By the use of these facilities in combination with tank-car movements from points in Illinois, Indiana and Ohio, shipments to eastern refineries and terminals can be increased.

The week's developments also revealed that additional pipe lines will have to be built before certain areas can be given increased allowables. Pipe-line outlets in West Texas and New Mexico are less than the state allowables and last week one large buyer found it necessary to prorate crude-oil purchases. Curtailment in the movement of crude south from other areas is in prospect.

Design of 100-Octane Units Being Standardized by OPC

By H. STANLEY NORMAN

WASHINGTON, D. C., Feb. 9.—Self-contained, combination units for the production of 100-octane gasoline, designed in such a manner that several small refiners may contribute the charging stock to each, will become available in the near future. Engineers of three construction companies have been working on standardization of design for several weeks, under the direction and at the instigation of Wright W. Gary, director of the refining division for the Office of Petroleum Coordinator.

The program through which it will be possible for small refiners to pool their charging stocks to the self-contained unit basically involves catalytic cracking and alkylation. Since demands for components for the manufacture of synthetic rubber became acute in the petroleum industry, the basic design has been amplified to permit the production of 100-octane gasoline, butadiene, styrene, and toluene in the single self-contained unit.

Charging stock would consist of gas oil, reduced crude or naphtha, depending upon the supply available from the contributors. Residue from the catalytic cracking operation will be returned to the supplying refiner in the proportion to which he supplies the charging stock, or by some other ratio mutually satisfactory to all contributors and this goes back into the normal trade channels for additional processing or for direct sale as fuel oil.

The entire program which required months to develop in its present state of near fruition is based upon reluctance of the Office of Petroleum Coordinator to waste money on individual plants that might become economic liabilities to their owners when peace is restored.

A temporary production goal of 180,000 bbl. of 100-octane gasoline is the current objective of the OPC. Figures up to 250,000 bbl. per day are more frequently heard as the ultimate production requirements for 100-octane gasoline.

The self-contained units are being designed in two basic capacities for production of either 5,000 or 10,000 bbl. of 100-octane gasoline per day. Modifications of the two basic capacity designs will be available to refiners but at the moment the refinery division of the OPC doubts that plants smaller than 2,500 bbl. daily will be economically sound.

Essentially, operation of the self-contained, standard 100-octane plants, which because of the range in capacities need not be restricted to small refiners, consists of relatively simple fundamental steps. First consideration is availability and accumulation of the gas oil, reduced crude or naphtha charging stock. Next is the processing which branches out from the initial catalytic cracking units into alkylation or possibly into closer fractionation for recovery of butadiene and toluene. The final phase is return or disposal by mutual agreement among the contributors of the cracking residue.

When full details of design are completed in the near future, the OPC, meanwhile, hopes to have completed a standard contract by which refiners may make a prompt start in contributing to the 100-octane-gasoline program and possibly to the production of the other hydrocarbons urgently required in the war program. Any group of refiners giving consideration to installation of the type of 100-octane plant envisaged by the OPC will have to either form an operating corporation or some form of acceptable partnership arrangement. Otherwise, the Government's contractural policies will interfere with implementation of the individual-plant program. The Government, according to the preliminary concept of the 100-octane, self-contained plant contract, would agree to buy all the 100-octane gasoline, the butadiene, and toluene. Residual from the first stage, catalytic cracking, would not be contracted by the Government. Disposal of the cracking residue would be the responsibility of the individual contributing companies. If a refiner contributed, for example, 1,000 bbl. of gas oil daily to the self-contained, 100-octane unit, he would expect to receive back about 400 bbl.

Substantial quantities of 100-octane blending material originate in catalytic cracking plants as shown here

Disposal Options

Because the Government has no interest in what becomes of the residue from the original cracking stock, contributing companies will have numerous options for disposal of the rejected material. It is possible that one of the several companies contributing to the original charge may need additional quantities of cracking stock in his individual facilities and will be in position to take more than his proportionate share of the 100-octane-gasoline-plant residue. This illustrates the flexibility of the plans for increasing 100-octane-gasoline production on a basis that will afford practically all refiners in the country an opportunity to participate in the program. Earlier proposals, involving segregation of the butane, isobutane, and isopentane from refinery gases at the original point of refining and then accumulating these stocks at a central point for alkylation into isooctane have been abandoned as a general rule. Likewise, proposals for the erection of selective polymerization plants at some of the scattered refineries with limited charging capacity as a means of providing base stock of the desired hydrocarbons are no longer receiving serious consideration in the problem of tapping all the available sources of 100-octane gasoline.

There are revolutionary operating changes ahead for the refining branch of the industry. Fundamentally, the changes revolve around a reduction in the production of automobile gasoline, involving a secondary step of increasing the revenue from fuel oils. It is not yet entirely clear how the problem of increasing fuel-oil values will be met but, presumably, a relaxation of price ceilings or a general elevation of the market structure for heating products is indicated. Contracts with the Government on 100-octane-gasoline plants, or those contributing components of fighting airplane fuels, are based on liquidation of the investment in 3 years. Consequently, it follows that the primary period will be the critical financial era for the refining industry, although a graduated decline in the Government contract price for 100-octane fuel, if options are exercised for extensions, will tend to reduce the profit accruing to refinery operators from the superaviation fuel.

Several weeks ago, Coordinator Ickes disclosed that 100-octane-gasoline production at that time had risen to 50,000 bbl. daily. Assurance is given, however, that production is "substantially greater today than the figure mentioned by Secretary Ickes." Most of the "substantially greater" production has been obtained by changes in existing facilities. Adjustments in the use of raw materials have been made to derive the ultimate maximum yield from the plants in operation. Certain exchanges of stocks have been negotiated to enable alkylation, isomerization, hydrogenation, and catalytic cracking plants to produce their maximum capacity. In several instances the plants producing components of 100-octane gasoline are obtaining yields substantially in excess of their designed capacity by operating on selected stocks.

Cost Nearly Billion Dollars

The combined oil-industry programs for production of 100-octane gasoline and the synthetic-rubber hydrocarbons will cost between $750,000,000 and $1,000,000,000, although, here again, the exact total will depend on the sizes of refinery units installed and any unpredictable expansion in the plans. Suggestions already heard that the 100-octane-gasoline production figure may be forced up to 250,000 bbl. per day is merely a suggestion of the uncertainties involved in attempting to arrive at an exact durable figure.

Of course, the refinery branch of the industry isn't expected to supply all butanes, isobutanes, and isopentanes required to implement the 100-octane-gasoline and synthetic-rubber program.

Survey of the butanes available from the natural-gasoline plants of the country, one of the major projects of this division of the OPC, has not been completed, although officials are attempting to have a figure by February 20.

Indications are that butanes diverted from normal distributing channels of the natural-gasoline industry will be used chiefly in synthetic-rubber production. Yields of 50 to 60 per cent butadiene, the basic component of the type of synthetic rubber now apparently favored, are possible and have been demonstrated to be commercially practicable in pilot-plant operation in the Middle West.

The analysis of W. L. Nelson, on Pages 10 and 11, The Oil and Gas Journal, January 22, indicate that more than enough butanes are being lost, burned, discarded, and otherwise unused in natural-gasoline-plant operations of the country to satisfy the current program of 400,000 tons of synthetic rubber. According to Mr. Nelson, and none of the technologists in Washington have disputed his conclusions, a conservatively large figure of butanes needed to produce 400,000 tons of synthetic rubber annually, would be 45,000 bbl. daily.

While working on the program of spreading participation in 100-octane-gasoline production on a practical basis to the small refineries of the country, the OPC and the industry have not been idle. Defense Supplies Corp., subsidiary of Reconstruction Finance Corp., has disclosed signature of contracts for entire output of 100-octane gasoline from at least five refineries involving additions to plant capacities totaling 35,460 bbl. daily. Defense Plant Corp., another subsidiary of RFC, is to build two 100-octane-gasoline plants at refineries of Pure Oil Co. and Southport Petroleum Co., with the oil companies engaged as operators of the superfuel units. (Details of these contracts were discussed on Page 20, The Oil and Gas Journal, January 22.) The Texas Co., Standard Oil Co. of New Jersey, and Magnolia Petroleum Co., are the three companies building and operating plants under contract with the Defense Supplies Corp. Under the latter type of contract with the Government, DSC finances only a part of the capital investment in new-production facilities. The stipulated price for 100-octane gasoline in the DSC contracts with the three companies ranges from 12 to 13.5 cents per gallon.

Numerous other 100-octane-gasoline projects are now pending. Some are bogged down in the ramified machinery of the War Production Board. Delay of WPB confirmation is largely because this basic agency for allocating materials already has made commitments of alloy metals equal to, or in excess of, the steel industry's capacity to produce them. Unfortunately, the alloy metals necessary for parts of the special plants for producing 100-octane gasoline and butadiene throw the oil industry in direct competition for limited supplies with the War and Navy departments.

Technicians, however, are working long hours in Washington attempting to adjust any dislocation of essential metals. Appreciation of the oil industry in Government offices that count is one of those insidious growths, difficult to reduce to a simple statement but obviously present.

Obviously, there are a few refiners operating at isolated inland districts, which cannot participate in the 100-octane-gasoline program because of economic limitations on volume, quality of crude, transportation, or other governing factors. With relatively few exceptions, however, the OPC visualizes a place for a big majority of the refineries to participate to some extent.

The refinery division wants to know all about yields, process, types of crude available, and other pertinent details of all operations for the express purpose of determining how each may fit into the coordinated picture.

Looking ahead beyond the war, indications are that petroleum refiners will have adequate demand for high-octane fuels to fully engage all facilities built for emergency requirements. There is general agreement that postwar gasoline will level off at much higher octane values than anything visualized prior to the emergency.

•

PIWC Committee Recommends Means for Increasing Reserves

WASHINGTON, D. C., Feb. 10.—A broad program of how petroleum reserves of the country may be not only maintained but increased for effectual prosecution of the war was placed this week before Coordinator Ickes. The study was made by a committee of nine members of the Petroleum Industry War Council after Coordinator Ickes had asked for an investigation of abandonment of small wells and the method of increasing oil reserves.

Seven specific conclusions were reached by the committee. These are listed in the accompanying box.

"Coordination of the activities of all individuals and operating units of the petroleum industry into a unified effective whole with the purpose of providing our armed forces with an abundance of every petroleum need," wrote the committee in its report, "is not only desirable, but essential."

The committee pointed out that petroleum reserves are the highest ever recorded but deplored the declining rate of additions and viewed the approximate balance of production and discoveries as a warning that this trend should cease. Prolonged decline in reserves, the committee cautioned, would make more difficult the application of the optimum rate of withdrawals from individual fields.

An increasing total number of wells must be drilled in order to discover the same amount of oil as formerly because of the increasing number of unsuccessful wells which adds to the already high cost of finding and producing petroleum. In the 1938-40 period, the committee reported, there were 700 dry holes drilled for each major field discovered. (Major fields were defined as those whose ultimate production will exceed 20,000,000 bbl.) During the 1934-36 period, the committee continued, there were only 280 dry holes drilled per major field discovered.

A significant relationship was pointed out between discoveries and crude prices to amplify the incentives most influential in spurring exploration. In 1924-26, when the average price of crude was $1.90 per barrel, there were 20,100 dry holes drilled. But when the average price declined to

(Continued on Page 77)

SEVEN CONCLUSIONS REACHED BY COMMITTEE

1. Additions to the nation's known oil reserves have shown a declining trend for the past 3 or 4 years.

2. New reserves are needed in order to meet indicated consumptive demand without waste.

3. There is an indicated trend of increased abandonment of small wells.

4. An increased number of wells must be drilled in order to discover the same amount of oil as formerly.

5. Premiums granted discovery wells in the form of increased allowables are an incentive to exploration.

6. Adequate prices for crude oil, which give consideration to over-all costs, are essential to exploration incentive and to extend the economic life of small wells.

7. Retention of present statutory percentage depletion allowance is essential to the above objectives.

A.I.M.E. Studies Oil's Part in War at Annual Meeting

By J. P. O'DONNELL

NEW YORK, Feb. 10.—War and subjects related to war dominated the annual meeting of the American Institute of Mining and Metallurgical Engineers now in session here. This was evident at the all-institute luncheon Monday when Lord Marley spoke on "British Unity for War Production," and will be in further evidence at the annual banquet tomorrow when Max W. Ball, president, Abasand Oils, Ltd., will speak to the institute on "Anglo-American Responsibilities." At the same time a gift of $1,000 will be given to the American Red Cross through the institute by the American Cyanmid Co. in lieu of the souvenirs customarily presented at the banquet.

The Petroleum Division did not escape the influence of war with four of the eight papers scheduled for the economics session discussing various aspects of the conflict. It is also expected to affect the foreign-production symposium though the scheduled program for this session is unexpectedly broad and varied. Still another effect of the war on the Petroleum Division was the enforced absence of the new chairman, Harry P. Stolz, consulting engineer and geologist with the firm of Stanley & Stolz, of Los Angeles, Calif., who was scheduled to take office at this meeting. Mr. Stolz, a lieutenant commander, was called to active duty last summer and assigned to the office of inspector of naval petroleum reserves in California as assistant inspector of reserves.

Despite the fact that the Petroleum Division accounts for the largest divisional membership in the institute, only one oil man, William B. Heroy, president of the Pilgrim Exploration Co., Houston, Tex., was elected to an institute office. Mr. Heroy is one of the nine 1942 directors. John R. Suman, vice president and director of Humble Oil & Refining Co., Houston, is retiring president and as such was to preside at the annual business meeting and the banquet.

New Officers

Officers of the Petroleum Division who will serve under Chairman Stolz through the 1942 term are: associate chairmen, W. S. Morris, field chairman, East Texas Engineering Association, Kilgore; Veleair C. Smith, consulting engineer and geologist, Charleston, W. Va., and Charles A. Warner, superintendent of the land department, Houston Oil Co., Houston; secretary-treasurer, Harold Vance, head of the petroleum engineering department, Texas A. and M., College Station, and the following members of the executive committee, of which Mr. Stolz is also chairman:

C. J. Coberly, president, Kobe, Inc., Huntington Park, Calif.; R. B. Kelly, division manager, Pure Oil Co., Olney, Ill.; F. B. Plummer, bureau of economic geology, University of Texas, Austin; C. E. Reistle, Jr., chief petroleum engineer, Humble Oil & Refining Co., Houston, and Eugene A. Stephenson, professor of petroleum engineering, University of Kansas, Lawrence, and retiring chairman of the Petroleum Division.

Those who will serve as chairmen of standing committees of the Petroleum Division are: C. H. Keplinger, Shell Oil Co., Inc., Wichita, Kans., production engineering; Ernest K. Parks, consulting geologist and petroleum engineer, Los Angeles, associate chairman for production engineering; M. T. Halbouty, consulting geologist and petroleum engineer, Houston, associate chairman for production; Winthrop P. Haynes, Standard Oil Co. of New Jersey, New York, associate chairman for production.

Basil B. Zavoico, department of petroleum economics, Chase National Bank, New York, production; P. E. Fitzgerald, research geologist, Dowell, Inc., Tulsa, engineering research; Norman D. Fitzgerald, petroleum economist, Chase National Bank, New York, economics; Walter Miller, vice president, Continental Oil Co., Ponca City, Okla., refinery engineering; Paul Weaver, geologist, Gulf Oil Corp., Houston, membership; Stuart Buckley, production research division, Humble Oil & Refining Co., Houston, papers and program, and E. G. Trostel, petroleum engineer, Union Oil Co., Santa Fe Springs, Calif., associate chairman for papers and program.

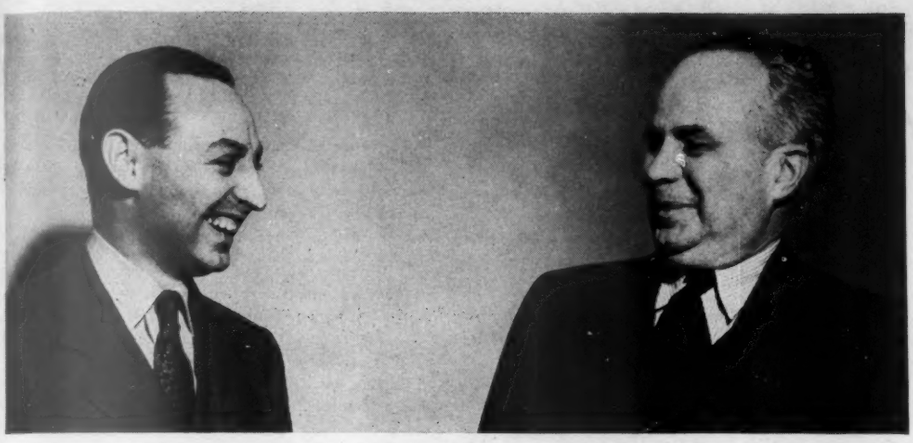
Technology Meeting Holds Interest

Petroleum Division sessions were inaugurated with the technology meeting which opened this morning. Each of the nine papers met the high standards of the institute and their presentation and discussion lasted into the late afternoon. Tomorrow the symposium on foreign and domestic oil production will be held. Speakers who are to address the foreign section and their subjects are: Mario L. Villa, gerente general, Yacimientos Petroliferos Fiscales, Argentina; Otto Schlagenweit, Bolivia; J. E. Brantley, president, Drilling & Exploration Co., Brazil; O. B. Hopkins and O. C. Wheeler, International Petroleum Co., Ltd., Colombia and Peru; P. E. T. O'Connor, geologist and petroleum engineer, Antilles Petroleum Co., Ltd., Trinidad; T. R. Armstrong, Standard Oil Co. of New Jersey, Mexico; G. S. Hume, Canada Department of Mines and Resources, Canada; Max Ball, Abasand Oils, Ltd., Progress in Athabaska Oil Sand Development; J. Terry Duce, California-Arabian Standard Oil Co., Saudi Arabia and Bahrein Island, and Mr. Zavoico, Russia.

In view of the Russo-German war, Mr. Zavoico's talk is timely. He points out that Russian production rose 19,650,000 bbl. in 1941 and credited the rise to circumstances which forced the industry to depend on itself and did not permit it to place blame for failure on others. In some instances men are being replaced by women and much reclaimed material used to increase production. He estimates 1941 production as follows: Baku, 172,000,000 bbl.; Grozny-Dagestan, 13,500,000 bbl.; Kuban, 15,000,000 bbl.; Ural-Volga, 27,500,000 bbl.;

(Continued on Page 76)

Above: Two A.I.M.E. figures familiar to oil men are E. J. Kennedy, Jr., assistant to the secretary, who is in charge of the institute's technical publications, and Chester Naramore, assistant secretary, who devotes much of his time to the Petroleum Division. Above, right: Winthrop P. Haynes, geologist, Standard Oil Co. of New Jersey, elected associate chairman for production, Petroleum Division, A.I.M.E. Right: Basil Zavoico, geologist, and Norman D. Fitzgerald, petroleum economist, department of petroleum economics, Chase National Bank, newly elected chairmen for production and economics, respectively



J. W. Ristori, assistant, and R. V. Whetsel, manager, foreign oil department, Petroleum Advisers, Inc., (Cities Service Oil Co.), who are coauthors with V. R. Garfias of the same company of the A.I.M.E. paper on "World Petroleum Consumption," a portion of which is presented on this page

OTHER A.I.M.E. MEETING FEATURES IN THIS ISSUE

In addition to the general account of the annual meeting of the Petroleum Division, A.I.M.E., starting on the opposite page, and the story on this page, five pages of abstracts of technical-session papers are presented in the Engineering and Operation Section of this issue, starting on Page 42. A biographical sketch of Harry D. Stolz, new chairman of the division, appears on Page 81.

World-Wide Oil Consumption Reaches Record-Breaking High in 1941

By V. F. GARFIAS, R. V. WHETSEL, and J. W. RISTORI
Cities Service Co.

FIGURES of world consumption of petroleum and its substitutes in 1941, which obviously are largely conjectural, are estimated at 2,066,653,000 bbl. It is 48,689,000 bbl. more than the previous year and is an all-time high. This figure, except for the United States, does not include consumption for military purposes. Consumption in the United States also reached an all-time high during 1941, totaling 1,492,000,000 bbl., or 158,230,000 more than the previous peak year of 1940. On the other hand it is estimated that civil consumption in countries outside of the United States decreased 109,541,000 bbl. as compared with the previous year.

Demand for military purposes and/or additions to stocks in countries outside of the United States is estimated at 304,507,000 bbl. during 1941 compared to 209,635,000 bbl. in 1940. This increase was due largely to blitzkrieg warfare in several fronts, especially Russia, which resulted in large expenditures of petroleum by both sides due to the immense area covered by the fighting forces, the long supply lines necessary and the intensity of the fighting.

It is interesting to note in this connection that Axis controlled countries excluding Japan had an estimated production of approximately 89,000,000 bbl. of petroleum and its substitutes in 1941. The peacetime consumption of these countries in 1938, for example, was about 183,000,000 bbl. It is believed that the minimum to which civil consumption could possibly be reduced in wartime is 20 per cent of peacetime which would call for a minimum consumption in these countries in 1941 for civil purposes of 37,000,000 bbl. This would leave a balance of only 52,000,000 bbl. or 142,000 bbl. daily available for military purposes in 1941 and any additional supplies must come from storage.

Regarding Japan if we take 20 per cent of its 1938 civil demand of petroleum and its substitutes, which consumption was already then substantially reduced because of the war with China, we would arrive only at 5,000,000 bbl. The 1941 production of petroleum and substitutes is estimated at 8,200,000 bbl., leaving 3,200,000 bbl., or 8,800 bbl. daily, for military purposes.

WORLD CONSUMPTION OF PETROLEUM AND ITS SUBSTITUTES—1941
(Thousands of barrels)

	Motor fuel	Kerosene	Gas and fuel oil	Lubricants	Misc.	Total
United States	*671,000	70,000	560,000	32,000	159,000	1,492,000
Russia	23,000	38,000	54,000	7,500	16,000	138,500
Canada	22,000	800	22,000	1,400	4,500	50,700
Argentina	8,500	1,300	20,100	600	2,500	33,000
United Kingdom	13,000	2,000	14,500	1,200	1,300	32,000
Japan	7,200	1,400	14,000	1,700	2,000	26,300
Mexico	4,300	1,100	14,000	280	4,000	23,680
Germany	7,000	400	9,500	1,500	2,600	21,000
Netherlands West Indies	250	50	15,800	60	4,000	20,160
British Indian (except Burma)	3,000	6,000	5,000	950	850	15,800
Italy	2,100	560	10,000	720	800	14,180
Australia	7,000	1,000	3,200	400	800	12,400
Rumania	1,000	1,300	8,200	170	1,100	11,770
Netherlands East Indies	1,500	2,000	6,500	260	1,500	11,760
Venezuela	1,400	210	9,000	100	400	11,110
France	3,000	300	5,300	400	1,000	10,000
Union of South Africa	5,000	500	3,100	320	400	9,320
Iran	520	1,000	5,200	340	2,100	9,160
Brazil	2,800	750	4,500	290	450	8,790
Egypt	850	2,500	3,100	180	430	7,060
Cuba	870	110	4,900	70	160	6,110
British Malay	1,150	450	3,700	140	230	5,670
Chile	910	65	4,300	100	90	5,465
Trinidad	140	75	4,600	40	450	5,305
Uruguay	950	310	3,600	80	120	5,060
Philippine Islands	1,250	400	2,700	130	160	4,640
Hawaiian Islands	1,300	200	2,700	150	110	4,460
New Zealand	2,600	210	1,200	130	260	4,400
China	770	1,500	1,400	190	230	4,090
Panama Canal Zone	160	30	3,100	30	40	3,360
Netherlands	900	500	1,480	120	200	3,200
Colombia	1,100	120	1,800	40	140	3,200
Peru	810	180	1,900	30	180	3,100
Aden	14	10	3,000	1	50	3,075
Spain	1,600	100	1,100	120	100	3,020
Sweden	1,000	200	1,590	80	130	3,000
Ceylon	300	200	2,300	20	70	2,890
Puerto Rico	600	90	1,300	50	60	2,100
Irish Free State	900	500	290	60	220	1,970
Jamaica	230	70	1,600	15	50	1,965
Denmark	500	300	830	70	100	1,800
Belgium	700	250	510	140	200	1,800
Palestine	320	400	700	30	180	1,630
Norway	500	140	860	30	70	1,600
Hungary	530	400	400	80	80	1,490
Hong Kong	100	80	1,100	40	30	1,350
Portugal	500	300	400	60	40	1,300
Iraq	100	80	800	20	250	1,250
Burma	150	40	800	40	200	1,230
French West Africa	90	40	1,000	14	5	1,149
Guatemala	130	20	870	10	40	1,070
Greece	160	80	680	30	50	1,000
Switzerland	180	40	635	5	40	900
Turkey	300	220	304	36	10	870
Finland	410	160	40	40	50	700
Kenya and Uganda (including Zanzibar)	270	60	210	20	10	570
Algeria	250	90	110	20	30	500
French Morocco	210	35	100	15	40	400
Yugoslavia	110	100	130	20	40	400
Poland—(included with Germany)	.....	.....	.....	.....	.....	.....
Czechoslovakia—(included with Germany)	.....	.....	.....	.....	.....	.....
Miscellaneous	4,024	1,839	3,859	404	748	10,874
Total	811,508	141,164	849,898	53,090	210,993	2,066,653

*Includes 9,000,000 bbl. of butane propane.

This Week...

Rumors in Washington that an order is being drafted to swing entire oil industry under direct control of War Production Board bring support for continuance of the Office of Petroleum Coordinator for National Defense. Chairman Nelson of WPB denies having plans to absorb OPC.

●

The Petroleum Industry War Council, which replaces the Petroleum Council for National Defense, appoints several standing committees to carry on its expanded war program. Council adopts the slogan "Oil Is Ammunition—Use It Wisely."

●

Tank-car shipments of crude oil and petroleum products to Atlantic seaboard points increase nearly 20 per cent in 1 week, aggregating approximately 160,000 bbl. daily.

●

Plans to assure that the petroleum industry will do everything possible to support the war program were outstanding at the annual meeting of the petroleum section of the A.I.M.E.

●

California oil industry seeks special state cooperation to protect properties following warning that well-organized sabotage plot awaits zero hour to be carried out.

●

OPC sponsors pooling program to expedite the transportation and distribution of supplies due to tanker shortage.

●

Combination unit developed from the pooling of processing methods under the direction of OPC's refining division is to be used in solving the 100-octane production problem. Output of 250,000 bbl. daily by 1943 predicted.

●

OPC calls upon California oil companies to increase tank-car shipments to Pacific Northwest to prevent shortage of supplies there due to the slowing up in tanker movements.

●

Unfavorable developments for Allies at Singapore increase threat to Dutch and British oil supplies of the East Indies.

●

Gulf Coast refiners mystified by OPA price schedule which gives nonintegrated refiners a ½-cent per gallon higher ceiling in gasoline sales than their integrated competitors. Due to excess supplies sales are being made at integrated prices.

●

Restriction of crude-oil purchases in West Texas and New Mexico by Atlantic Pipe Line Co., impresses industry with need of possible reduction of production allowable in Texas.

●

Indicated consumption of motor fuel for January exceeds most optimistic predictions despite effect of tire rationing, tanker losses and transfers.

●

Hearing by the Cole petroleum investigating committee expected to clear the atmosphere of many uncertainties regarding wartime regulation of the industry.

●

OPA's Schedule 88 establishing ceilings based on oil prices in effect October 1, 1941, will have little effect in current trading. Prices on several products now lower than they were October 1.

●

National organization being perfected by Mid-Continent Oil and Gas Association to carry on drive to salvage scrap metals of oil fields and refineries.

●

Refiners asked by OPC to increase shipments of fuel oils to eastern points where large quantities are required for war uses. The carrying out of this program may bring rationing of gasoline in that area.

Industry War Council Prepares To Expand Activities

By H. STANLEY NORMAN

WASHINGTON, D. C., Feb. 10.—Full realization that the oil industry has a task to perform in this war that will afford little opportunity for the ordinary type of operations was taken home last week by members of the Petroleum Industry War Council. This council formerly was known as the Petroleum Council for National Defense. For 3 days, the council membership, consisting of 72 key men from all parts of the country, had heard this general declaration or minor deviations thereof driven home by top men in the Office of Petroleum Coordinator.

Some of the discussions were tedious, others not particularly pertinent, but added up they gave a reasonably accurate reflection of democratic agencies in operation. A discordant note, although it was never mentioned while the council was in formal session, was the rumor afloat that an order is in draft form awaiting action of Donald M. Nelson to swing the entire oil industry under direct control of the War Production Board. Confirmation was lacking in all official sources but a large percentage of the oil men in Washington for last week's meeting had heard the rumor from one source or another.

Some of the council members expressed belief that the rumor was perhaps based on pure speculation and linked with the unlimited authority assigned to the War Production Board in the White House proclamation appointing Director Nelson. There was considerable discussion in the council meetings over the remaining overlaps in the authority of the War Production Board, the Office of Price Administration and the Office of Petroleum Coordination. Too, there was some criticisms that the council had failed to take an aggressive part in the coordinating program.

The outline of industry council functions woven together from the concepts presented by Coordinator Ickes, Deputy Coordinator Davis and the heads of each industry division appeared to give all members and the group at large a clearer understanding of just what the OPC expects.

A closer tie between the PICW and the OPC appears certain to result from appointment of the five district chairmen of each functional committee designated by Coordinator Ickes earlier as the standing committee for the council in each branch. The production chairmen of the five districts into which Coordinator Ickes divided the country at the time his organization was created now become members of the council's standing committee on producing operations. The same procedure applies to the other district functional committees.

A committee on petroleum economics was created as a new function of the council.

Official recognition was also given to the importance of protecting petroleum facilities from damage by saboteurs or from direct military action. The council appointed a standing committee of 18 oil men to study and deal with the problem of protecting petroleum facilities. Its chief functions will be to coordinate plant protective work of oil companies with recommendations of the War Department, the FBI and other governmental agencies concerned with protection of American industries under the war program.

The council approved a general advertising program which will be incorporated into the individual company's copy. The principal slogan in the program is "Oil Is Ammunition—Use It Wisely." There are other appeals in the entire program dealing with proper treatment of cars and tires. A committee headed by W. Alton Jones, president of Cities Service Co., developed details of the advertising program which will be made available to all distributing companies on a basis of proportionate cost relative to the volume of stickers, billboard displays and other mediums utilized.

There was comparatively little discussion of priorities in the council meeting, although the general subject of apparent overlap of functions between OPC, OPA and WPB fit into this picture to some extent. Rather frank comment developed, however, about the petroleum coordinator's announcement a week earlier of the method used in assigning state quotas upon a basis of proven reserves. Council members with refining interests in the northern part of the Middle West and in the eastern section along with those in the Mid-Continent were particularly critical. A suggestion was made that the formula might be changed to permit stripper wells to produce without restrictions and then apply the OPC formula only to the flush fields. This suggestion, others pointed out, might have the practical effect of penalizing flush fields to a discriminatory extent. Agreement of the coordinator's staff to check into

(Continued on Page 77)

Motor-Fuel Demand in January Rises Despite Adverse Factors

By J. P. O'DONNELL

NEW YORK, Feb. 10.—January demand for motor fuel produced in this country is estimated at 52,000,000 bbl. on the basis of a summary of individual calculations made from available American Petroleum Institute reports on production and stocks and company reports on shipments. This is an increase of 4,611,000 bbl. or 9.7 per cent over actual January 1941 domestic consumption and exports. This indicated demand exceeds the most optimistic predictions and refutes predictions which considered the possible effect of tire rationing, tanker losses and transfers and other factors to reach the conclusion that motor-fuel consumption would decline.

Individual estimates of January consumption vary fantastically. Some, based entirely on company sales reports, estimate last month's demand at from "slightly less" to "about 2 per cent more" than the previous January while others place it as much as 10.5 per cent greater. One statistician, basing his conclusion entirely on A.P.I. reports, estimated over-all demand at 53,850,000 bbl., including an assumed figure of 3,000,000 bbl. for export. This would show an increase of 13.6 per cent in over-all demand and a 12.1 per cent increase in domestic demand. While this estimate far exceeds all others it is substantiated by the fact that monthly estimates made during 1941 on the same basis varied only one-half of 1 per cent from Bureau of Mines data with a maximum variation of from 3 per cent lower to 2.3 per cent higher.

Reluctant to Accept Figure

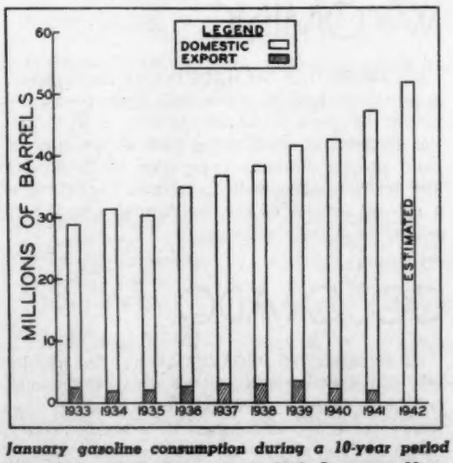
Many industry economists are reluctant to accept estimates of an increase of 10 per cent or greater. This reluctance is caused principally by the fact that reports from their sales departments indicate a much smaller increase. However, most of these reports cover only the first 2 or 3 weeks and, at least in some instances, they are admittedly incomplete. In addition, there is a growing disposition to place less reliance on weekly reports on account of great fluctuations. There is considerable evidence to the effect that consumption rose late in the month. One such indication is that travel over the George Washington Bridge, a major Manhattan traffic artery, was at the same rate as last year early in the month but rose as much as 10 per cent later. Similarly traffic through the Hudson and East River vehicular tunnels was up 6 to 7 per cent. These indicate that the effect of the tire-rationing announcement was similar to the effect of major war developments such as the outbreak of war in 1939, Dunkirk, Germany's invasion of Russia, and Pearl Harbor. Each of these events was followed by a period of conservation on the part of motorists which was quickly dispelled.

There have been some indications that nonessential driving has been reduced. Among these is the report that the January consumption increase was centered in industrial states while consumption in seasonal resort and suburban or rural areas was lower. Traffic on the Henry Hudson parkway in suburban New York was reported down 5 per cent.

Preliminary January figures indicate that at least the immediate effect of tire rationing was far from what many had expected. Additional evidence is contained in reports of vehicle registrations and operators' license applications. Up to February 1 there were 552,251 motor vehicles registered in metropolitan New York, an increase of 7.8 per cent. As of the same date, Pennsylvania reported 2,530,000 operators' license applications, an increase of 8.6 per cent. These figures prove that more cars were operating and more persons driving just as there were more people working as of February 1 this year than as of the same date a year ago.

Economists as a whole are unwilling to accept the indicated January demand as a portent of what to expect for all of 1942. At the same time not all of them are willing to accept predictions that gasoline consumption will drop drastically as a result of tire rationing. Several reasons are given for the latter stand: (1) Large stocks of tires are held by manufacturers and distributors which may be released since tires deteriorate in storage and holding them would prove false economy; (2) imports of rubber in January, according to a statement ascribed to Jesse Jones, were 76,000 tons, about 25 per cent greater than the 1941 rate of consumption; (3) many car owners had tires retreaded in December and January and should be prepared to operate their vehicles from 1½ to 2 years without tire replacement; (4) tire sales for replacements were the greatest in history in 1941.

If estimates of January demand prove reliable, it is apparent that the effect of tire rationing will be delayed and now even conservative statisticians look for an increase through the first quarter at least. However, available information is being watched closely for a break in the trend since the whole operation of the industry is geared to gasoline demand and its course determines the course of the industry. Transportation difficulties are of much more immediate concern to the industry than tire rationing. As a result of these difficulties stocks of refined products on the East Coast have declined at an alarming rate. Combined gasoline and fuel-oil stocks dropped 9,408,000 bbl. in the 4 weeks ended January 31, a reduction of 18.5 per cent. For the month as a whole the reduction is estimated at 20 per cent.



January gasoline consumption during a 10-year period from 1933 to 1942. Data prior to 1942, Bureau of Mines

Gulf Coast Stocks Piling Up

While stocks are declining on the East Coast, they are piling up on the Gulf, which normally ships 1,200,000 bbl. of crude oil and refined products daily to Atlantic ports. Gasoline in particular has been affected with stocks up 12 per cent in those 4 weeks to a point higher than they were at the end of March last year. This has caused a weakening of the price structure on the Gulf and has brought about a situation that may necessitate pipe-line proration. One company has already adopted this resort to bring crude purchases in line with reduced refinery demand and others are likely to follow. In view of the demand for 100-octane fuel it is considered probable that proration would fall most heavily on those fields which produce an oil unsuitable for processing into high-grade aviation gasoline. Another likely consequence is the shutting down of small independent refineries.

There seems to be no prospect of early improvement and unless resort to rail shipments, virtually doubled in January, can stave off a crisis until the delivery of new tankers is speeded up, probably early in the spring, some restrictive action may be unavoidable. At present the Gulf-North Atlantic fleet is operating far below normal due to sinkings, transfers to other services and to convoying. It was estimated that convoying reduced the efficiency of the tanker fleet supplying Great Britain by as much as one-third and if the same or even a smaller figure is applied to our coastwise fleet it is readily apparent that its efficiency is greatly impaired.

Inability to meet East Coast demands would affect the whole industry. In the first 10 months of 1941, 16 East Coast states and West Virginia and the District of Columbia represented 35 per cent of the domestic gasoline consumption as shown by state statistics while the same area normally consumes 45 per cent of the fuel oil. A 10 per cent reduction in East Coast gasoline demand would reduce the nation-wide total 3.5 per cent and a similar reduction in its fuel-oil demand would cut the national total 4.5 per cent.

There are two other disturbing factors on the industry's horizon: stocks and refining capacity. If demand continues at the January rate it will tax the ability of the industry since expansion of capacity is denied by lack of materials. Uncertainties of demand and the industry's ability to supply it, make the inventory position a cause of concern. Continuation of additions to storage at the rate that prevailed through January would make the March 31 total 108,000,000 bbl. This would not prove burdensome if demand remains at the apparently high January level but would constitute a depressing influence if demand drops.

STATE CAPITALS...

ESSENTIAL (THAT) CERTIFIED PRODUCTION RATES BE MET BY EVERY STATE WITHOUT DELAY. IMPERATIVE NEED TO ASSURE NATION OF ADEQUATE CONTINUOUS SUPPLY OF PETROLEUM PRODUCTS FOR ALL MILITARY AND ESSENTIAL CIVILIAN REQUIREMENTS ON SUSTAINED BASIS NO LONGER PERMITS HAPHAZARD PARTICIPATION BY STATES IN SUPPLYING NATIONAL DEMAND. . . . ANY STATE THAT MIGHT PERSIST IN EXHAUSTING ITS PETROLEUM RESOURCES AT ABNORMALLY RAPID RATE WOULD SERIOUSLY JEOPARDIZE NATIONAL DEFENSE PROGRAM. . . .

Thus, by telegram, did Robert E. Allen, director of production for the Office of Petroleum Coordinator, reply to a question from Claude V. Barrow of the Daily Oklahoman, Oklahoma City. The question: Should the state regulatory commissions of the oil-producing states interpret your recommended crude-oil production rates for February as an order or as a recommendation. . . .?

State officials, however, apparently were not so sure that the best interests of the nation at war would be served by the OPC formula of fixing crude-oil quotas. Protests of one kind or another came from most of the major oil states outside of Texas, which was benefiting from the formula, and California, which had too much else to think about.

Gov. Payne Ratner of Kansas announced early in the week that the Corporation Commission had calculated the new formula might result in a reduction of Kansas production allowable to 151,000 bbl. a day from the recent peak of 264,000 bbl. The commission, he said, was collecting further data on the new rules and would soon go to Washington to present objections on (1) the allocation formula based on a state's reserves and (2) the spacing requirements of Conservation Order M-68.

The Oklahoma Corporation Commission asked Petroleum Coordinator Harold L. Ickes for an early conference and declared that the lower production rates indicated by the new formula would seriously cripple the state's refinery industry, thus hampering the war effort. Demand for Oklahoma grade crude far exceeds current production and heavy withdrawals from storage are reported weekly.

From Salem, Ill., came word that an organized campaign to protest against both the production rates and the spacing restrictions was getting under way. Michigan was also asking a review of the production figures, pointing out that present production is barely enough to meet local refinery demand and that the state doesn't produce enough oil to serve its market area.

Only state to actually defy the OPC order, however, was Mississippi, a relative newcomer to important oil states. Daily average production for the week ended February 7 was 83,525 bbl., an all-time peak. The OPC recommended rate was only 57,400 bbl. Representatives of OPC were reported in Jackson trying to persuade state authorities to go along with the federal plan. Only indication of their success was a report that special legislation to control production was being considered.

States were getting ready to hold hearings on the March market demand and hoped for a relaxation of OPC demands before the hearings were completed, or at least before the orders were issued. Louisiana's Department of Conservation met this week, February 10, at New Orleans. Other hearings set were: Texas, Monday, February 16, at Austin; Oklahoma, Thursday, February 26, at Oklahoma City.

CALIFORNIA

SPECIAL WAR CONDITIONS will be reflected in the pool production quotas as set up under a new method proposed by the allocation committee and approved by the production committee for District 5 and the conservation committee of the California Oil Producers Association. To be applied in setting up pool allocations are factors of transportation, types of oil, and specialized demand.

When these modifications have been made by the production committee, the pool quotas will then be broken down by the allocation committee to the individual wells, and the whole program will be submitted to the Office of the Petroleum Coordinator in Washington for approval.

Only fields exempted from proration are those whose preliminary primary quota is within 10 per cent of the maximum efficient rate of production, except that in such fields no wells will have an allotment of more than 75 bbl. per day. It is estimated that 86 pools will be exempt from restrictions.

WYOMING

WYOMING HAS NO MACHINERY for enforcing a proration system which will keep production within the quota limits and the state is faced with the necessity of establishing such a system or depend upon volunteer cooperation by producers. The former course will necessitate the calling of a special session of the legislature, which it is desired to avoid if possible.

COLORADO

IN ANSWER TO PROTESTS from Rocky Mountain states over quotas set by the petroleum coordinator, Secretary Ickes set forth the basis upon which these are established in a letter to Gov. Ralph L. Carr, of Colorado. The governor opposed the establishment of a quota for Colorado which was below the state's consumption. Wyoming authorities had protested the lowering of that state's quota to less than the current demand. The secretary said that recognition is given to the relative ability of the various sources of supply to produce on an efficient and sustained basis in addition to considering the current demand. "It is imperative," he declared, "that we balance our current operations in order that we may be assured an ample supply of petroleum in the last as well as the earlier critical stages of the war."

ILLINOIS

REGULATIONS FOR SECONDARY RECOVERY of oil by water-flooding methods in Illinois will be published February 15, Robert Jean, assistant superintendent of the state Division of Oil and Gas Conservation, announced February 5, following a conference of operators.

Samuel F. Peterson, division petroleum engineer, said a second conference will be held before February 15 to add a supplemental list of rules for plugging, fire prevention, "and other uniform field practice."

Mr. Jean said the water-flooding rules were drawn after operators mapped a plan calling for reopening of the Westfield field in Clark County, center of active exploration more than 30 years ago. The first of a series of 25 water-input wells will be completed before March 1 in Section 21-11n-14w.

"Operators have reached a common agreement so that each adjoining property owner will receive the fullest protection possible," Mr. Jean said. He predicted that a large volume of oil would be recovered in the Westfield pool and in areas which have been abandoned for several years. Mr. Jean pointed out that operators may drill 16 wells to each 40-acre tract in secondary-recovery operations by means of artificial water drive.

TEXAS

THE STATE TAX on petroleum was paid on 498,686,623 bbl. of oil in 1941, Comptroller George Sheppard reported. This was an increase from the tax paid on 487,474,091 bbl. in 1940 Neither figure represents total production as the tax is not collected on state royalty.

Money income was $21,213,374, as against $14,359,194 in 1940. In addition, the pipe-line tax in 1941 amounted to $934,882, and in 1940, to $915,177. This money goes toward the support of proration enforcement.

The tax is on a basis of value and was increased during 1941. In January 1941, the tax return averaged 2.937 cents per barrel; in December, the average was 4.881 cents.

INDIANA

PRODUCTION FROM ANY one well in Indiana will be limited to 100 bbl. of oil daily according to an announcement made by Robert Reno, assistant state geologist, before a meeting of Indiana operators at Vincennes last week. He said the Conservation Department had adopted that limit to hold Indiana's output to 17,200 bbl. daily, the February quota recommended by OPC.

Ben F. Hake, Indianapolis, division geologist for Gulf Refining Co. and chairman of a committee named by operators several weeks ago to study control measures for the industry in Indiana, said there were fewer than 20 wells in the state capable of producing more than 100 bbl. daily. He said that the committee had found that of the 1,650 wells in Indiana 1,100 averaged but 1.8 bbl. a day and the remaining 550 were producing 16,500 bbl. daily. Of the later group only 100 wells are producing in excess of 50 bbl. daily, he said.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Time for Facts

The petroleum industry and its customers are entitled to a frank statement of fact in regard to the crisis rapidly developing in tanker transportation due to war developments.

Because of the military information involved, many of the details of what is happening in petroleum shipments on the high seas probably should not be revealed. But there is every reason why all divisions of the industry should be told just how the restrictions in tanker movements will affect their operations now and later. Any other course means disaster for many operators with millions of consumers caught short in oil supplies.

The attacks of the Axis on ocean traffic have spread to include the coastwise oil movements in the Pacific and Atlantic, with several tankers destroyed since the first of the year. Immediately involved are the 1¼-million-barrel daily tanker shipments from Gulf Coast to Atlantic seaboard refining and distributing centers. They furnish the petroleum supplies of approximately 40 million people of eastern and southeastern states.

Also involved are the export movements which, according to latest information available, aggregate more than 300 thousand barrels daily. The 250-thousand-barrel daily imports of oil all arrive at the shores of this country by water. Thus nearly 2 million barrels daily, or half of the total oil supplies in this country, are threatened in any general dislocation of ocean transportation.

Last summer and fall, when a shortage threatened due to the requisitioning of tankers for British use, the petroleum industry expanded every other type of transportation. This is being done again. Tank-car shipments of crude oil and refinery products to the Atlantic seaboard have jumped to more than 160,000 bbl. daily. As soon as weather conditions permit, the full use of inland water transportation is assured. New pipe lines have been completed and existing systems enlarged.

It is apparent, however, that expansion in inland shipping cannot offset a substantial decline in coastwise transportation. The inevitable reactions have been gaining momentum daily. Stocks along the East Coast are being reduced too rapidly. At the same time, inventories in sections dependent on the Gulf Coast for outlets are becoming excessive. New business, so far as coastwise and export movements are concerned, has slowed down and is nonexistent in the case of several refiners.

In the case of crude oil, a general reduction of purchases by large and small buyers affecting many Texas and Louisiana fields is assured if the restrictions in tanker shipments continue.

Equally obvious is the threat to buyers in a dozen or more of the largest petroleum-consuming states. These consumers and millions of others who ultimately will be affected if conditions are unchanged, want to know the why of these developments. They will have to be satisfied that everything is being done that can be done to expedite tanker movements.

If producers and refiners are faced with a major adjustment in their operations to continue indefinitely, they should know it before their storage tanks are running over in some parts of the country and are empty in other sections.

Government officials have indicated that while the production and shipments of certain products will be restricted, a normal or expanded output of other products may be necessary to supply war requirements. This will necessitate changes in field and plant operations which cannot be made overnight.

The unfavorable reactions to many of these developments can be alleviated if they are anticipated by those concerned. It is time that the transportation bottleneck be interpreted in terms that can be understood by producers and consumers of petroleum.

VIEWS for VICTORY

Demand Will Be Brisk, but Probably Quite Changeable

By WINSTON P. HENRY
President, Putnam Oil Co.

THE outlook in 1942 for the oil industry is so confused that it will take some time for changing trends to become obvious. In general, due to the great war activities, demand for crude oil and its products should be very brisk but, nevertheless, quite changeable in comparison with past history. For instance, if the restrictions on rubber tires are continued indefinitely, gasoline demands by motorists may not continue to increase, as during past years, but may actually drop off. As owners of cars endeavor to save their tires, naturally they will eliminate useless trips or long vacation tours. As the older tires wear out and if no new supply of rubber is available for retreading, numbers of individuals may be forced to use buses or double up on trips with their neighbors. Such necessities would cut heavily into gasoline consumption. On the other hand, we probably can expect a large increase in demand for fuel oil for factories, railroads and steamships and an equally strong demand for lubricating oils. However, I believe it will be some months before the trends suggested, and other similar trends, can be foretold with any accuracy.

Must Produce More of Products While Using Less Material

By B. A. HARDEY
Chairman, State Mineral Board, State of Louisiana

THE petroleum industry is presented with the task of producing and refining an increasing amount of crude oil during the present emergency and, at the same time, reducing the consumption of equipment and materials which are badly needed in national defense. It has organized competent committees to cooperate with the Office of Petroleum Coordinator and is making every effort to do this job.

The drilling of unnecessary wells and other wasteful practices are being eliminated and wider spacing of wells will result in uniform conservation practices in areas which have neglected conservation heretofore. New legislation should be enacted in several states to enable their regulatory bodies to cooperate with other states in enforcement problems. To facilitate a study of the problems affecting conservation and regulation, all states which do not belong to the Interstate Oil Compact Commission, should immediately make plans to join the compact and contribute their efforts toward a proper solution of these matters.

During the past 3 years, the petroleum industry has been producing crude oil at a rate which is reducing the present known reserves and it is necessary that new reserves be discovered to keep pace with future production. The basic price of crude oil should be raised as present prices do not warrant costly expenditures for exploration and deep drilling. Unless a price raise is granted, which will encourage new exploration our present reserves will become depleted too rapidly, and underground waste will result.

I am convinced that the industry will meet the task imposed upon it during this emergency provided the government authorities will permit a reasonable allocation of materials and equipment for production and refining and that the price administrator will not so restrict price as to discourage new development.

Industry Works Best if Efforts Not Cramped by Overregulation

By CHARLES A. BREITUNG
Independent operator

IT seems evident to everyone in the United States except these officials in the District of Columbia that the only way this war effort can be prosecuted to a successful conclusion is to allow the industries throughout the country to carry on their productive programs in all lines without the interference and bungling orders of these governmental agencies. We cannot expect to have anything but confusion as long as we have officials issuing orders and recommendations about which they indicate, in all charity to them, they must know very little.

This recent spacing order as affecting oil and gas drilling, is just one single instance of the confusion which can be developed in short order with such preposterous inflictions upon an industry which is doing its best to maintain the levels of production in oil and gas we now have.

We are told that there must be an even greater effort for a larger production of oil and a larger volume of gas. Certainly in order to do this job there must be less interference with the oil and gas industry that the men who have given the years of their lives in these industries may carry out a sensible and reasonable program.

We need no arbitrary fiats or rulings which disturb and upset and enrage everyone, but rather do we need the kindly and considerate attention of these officials of government who have the decency and the courtesy to confer with the operating men in the industry before they make any such ruling.

We realize full well that this must be an all-out effort in order to accomplish what the president has pointed the nation to do, and this effort cannot be hampered by ridiculous rulings and arbitrary orders which have no foundation of common sense, other than the theoretical desire to cut down on steel or copper or some other material.

In order for 1942 to achieve larger production of oil and natural gas, it will be highly essential that the commissions in our various oil and gas-producing states as well as the men of the industries in those states correlate their programs so that the best results are obtained without distractions or disturbances.

New-Discovery Rate Dependent on Adequate Price Structure

By C. H. LYONS
President, Louisiana-Arkansas division, Mid-Continent Oil & Gas Association

AN analysis of the relationship between prices and dry holes drilled from 1929 to 1941 shows that the up-and-down curve of the number of dry holes drilled closely follows the price trend. During the last depression when oil prices were low, wildcat drilling was only 35 per cent of what it was during 1939, when prices were fair. Further analysis of price and new discoveries between 1928 and 1940 discloses that the rate of average yearly discoveries in barrels also closely follows fluctuations in prices.

It is significant that these analyses show an upward trend in new discoveries during the recovery period through 1937, and that after the collapse of the oil price structure in 1938, the trend was reversed. These trends are conclusive evidence of the necessity of an adequate crude-oil price structure for sufficient oil reserves necessary to our national economy and to our national defense.

It is common knowledge that stripper wells are abandoned at a rapid rate when prices are inadequate. Of our 20 billion barrels of reserves on January 1, 1941, over 20 per cent, or 4 billion barrels, was given to wells of settled production. If the present price is maintained, a large percentage of these reserves will be lost through abandonment.

The oil industry does not seek extra profits. It merely asks for parity of prices with other commodities. Oil prices have been at an unsound level since 1938, and are now far below parity with prices of other commodities. Unless fair prices obtain, the producer cannot undertake the hazardous and costly exploratory work and wildcat drilling necessary to the discovery of new reserves. If present prices remain unchanged, we will not only decrease discovery of new reserves but will lose a substantial part of present reserves through the premature abandonment of stripper wells. If these things happen, the price administrator, and not the oil industry, will be responsible therefor.

Accidents lurk when power and speed crowd *PIPING TURNS* too!

In 6-day bicycle races, if riders come to grief—it's usually on the turns where speed and strain increase the danger. (I.N.S. photo)

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This compact piping installation illustrates four common points that occasion *changes in flow direction*—a welding tee at the top, then a 90° elbow, a reducing outlet welding tee at the right, and a concentric reducer near the bottom. Tube-Turn welding fittings are used here to guard against danger at these turns.

Cole Committee to Probe Oil-Regulatory Agencies

By HENRY D. RALPH

WASHINGTON, D. C., Feb. 9. — Hearings scheduled next week by the House petroleum investigating committee may bring into the open considerable undercover discussion about the oil situation and clear the atmosphere of many uncertainties regarding wartime regulation of the industry.

The hearings were announced by Rep. William P. Cole, Jr., chairman of the standing petroleum subcommittee of the House committee on interstate and foreign commerce. During the past several years this committee has made a series of investigations of various phases of the oil industry, and the current hearings were announced as being for the purpose of giving Congress up-to-date information about oil.

The first witness was scheduled to be Harold L. Ickes and members of the staff of the Office of Petroleum Coordinator, for the purpose of giving the committee a picture of the activities of the OPC since its creation last May 28.

The committee also will give special attention to the eastern seaboard supply situation, both as to gasoline and fuel oil. The sinking and diversion of tankers will be studied and also need for additional pipe-line construction. A study will also be made of the high-octane aviation-gasoline program and the effect on the oil industry of the projected synthetic-rubber program. Other oil-industry problems will be taken up at later hearings.

While announced as a routine procedure to obtain current information, the hearings may very well develop into a critical investigation of the oil industry's regulatory setup and its adequacy and effectiveness to meet war requirements. If some of the talk now going around the industry is repeated in public session, the Cole committee may make some definite recommendations which could be of much benefit.

WPB May Absorb OPC

For example, there is current report to the effect that the War Production Board is definitely planning to take over the entire wartime activities of the Office of Petroleum Coordinator and make the OPC staff an industry branch of WPB. Any such intention was denied this week by Donald M. Nelson, chairman of the WPB, who said, in answer to a question by The Oil and Gas Journal, that he sees no present need for such a reorganization.

Nevertheless, reports persist that there is continual and serious friction between OPC and WPB, resulting in many delays in securing action. The WPB has full power and authority and the OPC is purely advisory except to the extent that authority is delegated to it by WPB. It is no secret that on priority matters recommendations have been shunted back and forth between OPC and WPB for days and weeks without getting final action. Whether this is due to the innate clumsiness of the system or to jealousy and a struggle for power between the two organizations is a question which might be brought out before the Cole committee.

Another likely subject for the committee's consideration is Conservation Order M-68 and Priority Order P-98. Some oil men feel that M-68 is not primarily intended to conserve the industry's use of steel, but is basically intended to provide permanent federal control of drilling and production. Reasons for delays in getting desired amendments and interpretations of these two orders may also be discussed.

Incidentally, there appears to be no immediate prospect of important amendments in P-98, particularly the proposal to eliminate the requirement that an endorsement of an OPC district office must be obtained before any materials may be purchased or used. The OPC asked WPB to amend this provision but the request was rejected. A second proposal was then drawn by OPC which has not yet received action by WPB, and its fate seems to be most uncertain. It is understood that the second proposal would retain the endorsement requirement only for new drilling or construction, and that maintenance, repair, and operating supplies could be obtained in the same manner as by other industries operating under priority restrictions.

While the oil industry appears to be fairly well satisfied with the OPC in general and probably would prefer to have this organization continued as a separate unit rather than be merged with the War Production Board, there is considerable criticism of delays in OPC and of the lack of clear delineation of authority between OPC itself, the district industry committees, and the 72-man Petroleum Industry War Council. This situation was discussed quite frankly at the monthly meeting of the council last week, and so far as can be learned there were no definite results beyond the oral assurance of Coordinator Ickes that the district committees should handle local problems while the council, in cooperation with the district committees, should deal with national and inter-district problems. There is a possibility that the Cole committee may look into such internal operating difficulties of OPC and its industry groups.

Will Probe Pipe-Line Situation

Special significance is attached to Representative Cole's announcement that the committee will look into the pipe-line situation. Last summer when the Cole pipe-line act was put through Congress this committee recommended construction of the so-called national-defense pipe line to carry crude from Texas to the New York refinery area, but after plans for this line were well advanced, the Supply Priorities and Allocations Board, since merged into WPB, refused to allocate steel for its construction. The Cole committee is expected to reopen this defense pipe-line question now that the tanker situation has become more serious, and may possibly criticize failure to construct the line last year and may recommend its immediate construction.

The politically touchy subject of an oil shortage in the East may also be brought out by the Cole committee. Secretary Ickes has consistently refused to discuss this subject since he was publicly spanked last fall by the Maloney committee of the Senate, but reports are spreading of serious local shortages of both domestic and industrial fuel oil in various localities in the East. It is doubtful that the Cole committee will go over all the ground of the Maloney committee, particularly the controversy over the number of tank cars in the country, but some consideration of the shortage threat is expected.

Committee Would Spread Supplies

WASHINGTON, D. C., Feb. 9.—To meet a possible threat of shortage of petroleum products in the East, Petroleum Coordinator Ickes last week issued formal recommendation No. 33 creating a special committee with power to pool products and take other action to assure equitable spreading of supplies.

At the same time the OPC announced that tank-car shipments of petroleum into the Atlantic seaboard area during the week ended January 31 reached the unprecedented total of 5,125 cars, an increase of 181 per cent over the week of January 10.

The new committee on supplies and distribution will be composed of 16 members to be appointed by the industry general committee for District 1. It is charged with the specific task of obtaining distribution of available supplies in a manner that will assure the filling of all military, war industry, and essential civilian requirements. Formation of the committee was requested of the coordinator by representatives of the industry as a result of tanker sinkings and the diversion of tankers to military service.

The committee will have four functions:

1. To obtain, analyze and keep current all pertinent facts and figures concerning stock inventories and demand for petroleum products in District 1.

2. To coordinate, arrange for, and, after approval by the chief counsel and subject to the direction of the coordinator, carry into effect the sale, exchange and loan of petroleum and petroleum products among the various marketers and suppliers so as to speed and assure the distribution of available supplies to meet military, war industry, and essential and reasonable civilian requirements in that order.

3. In emergency cases, where found necessary by the district marketing director and subject to his direction, to make temporary arrangements for distribution and division of incoming supplies and existing inventories in a manner that will assure the meeting of war, defense and essential civilian demands as they arise.

4. In the event action taken under No. 3 is found by the district marketing director to be inadequate, to devise plans for the exchange, loan, sale, lease, or pooling of petroleum and petroleum products, and of production, transportation, refining and storage facilities wherever and to whatever extent may be necessary. Plans would have to be presented and aproved by the chief counsel of OPC before being effectuated.

In approving this recommendation, Thurman Arnold, assistant attorney general, refused to give it the usual immunity from antitrust action because of the "sweeping character" of the plan and the proposal to delegate authority to a committee of the industry. He reserved the right to notify the industry to cease and desist practices considered by the Department of Justice to restrain trade in violation of the antitrust laws, and to bring injunctions if the practices are not stopped.

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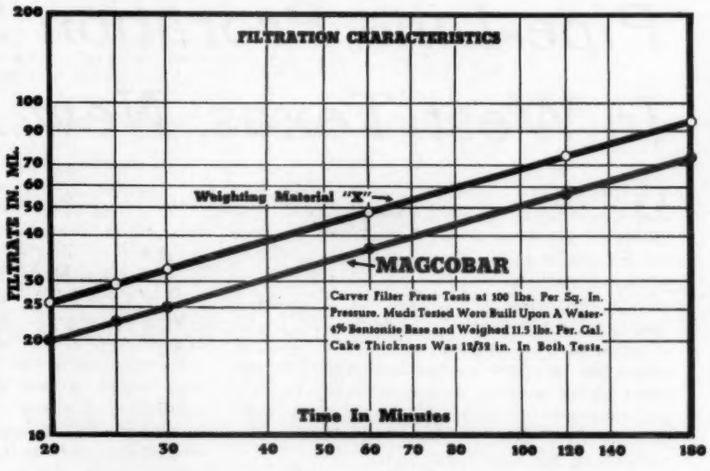

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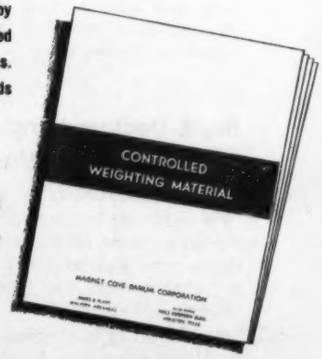

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BARIUM

Price Schedule 88 Has Little Effect in Refinery Trading

PRICE SCHEDULE 88, announced last week by the Office of Price Administration establishing price ceilings for crude oil and refinery products based on published quotations as of October 1, 1941, will have little effect in current trading, according to opinions of representative refiners and marketers. Posted crude-oil schedules now are generally the same as they were on October 1.

In the case of refinery products the October 1 prices are higher than the spot quotations in effect at this time. This is particularly true in the case of gasolines which have developed weakness since the first of the year with current quotations in several areas now ¼ to ⅓ cent under the October 1 levels.

There has been wide discussion among refiners in regard to the provision of Schedule 88 which establishes two sets of prices for Gulf Coast gasoline. The price ceiling on 80-octane gasoline for nonintegrated refiners is 6½ and 6 cents for the large integrated companies. No official explanation has been made of this action. It is said to have been brought about last summer when the smaller refiners complained regarding the 6-cent level and succeeded in obtaining a ½-cent advance from OPA. The larger refiners also sold material at 6½-cent schedule after the advance was granted. Gasolines are weak at this time so that gasoline is available at the ceilings, or less, established for the products sold by the integrated companies.

In addition to the exceptions announced in the original Price Schedule 88, OPA this week announced that prices for domestic sales of petroleum products in contracts signed prior to November 10, 1941, and for export sales of these products covered in contracts signed prior to January 20, 1942, may be maintained until March 1, 1942, under Amendment 2. This deferment will give the industry time to adjust its price structures so as to comply with the maximum prices issued February 2. Complete text of Schedule 88 and amendment will be found starting on Page 26.

Pipe-Line Proration Started In West Texas, New Mexico

DALLAS, Tex., Feb. 10.—Atlantic Pipe Line Co., effective Tuesday, reduced its daily purchases of crude oil from West Texas and New Mexico 22½ per cent, a cutback of approximately 7,200 bbl. from normal runs of about 32,000 bbl. daily. Other major purchasers are expected to take similar measures.

Action of this company was attributed to the congestion of crude on the Gulf Coast brought about by the shortage of transportation facilities and consequent inability of purchasers to move material from there to their normal consuming markets on the East Coast.

It also follows failure in efforts of this company and several other purchasers, principally, Humble Oil & Refining Co., to induce state oil-regulatory bodies to reduce allowable production in all the areas affected by the action.

For sometime, it was explained, crude oil has been piling up in storage, to a point that not only are tanks on the Gulf Coast, the outlet for most of the production, full, but also that the oil has backed up in West Texas and other areas of the state. No longer is there any place to put the oil, companies say.

Contributing to the West Texas and New Mexico pressure has been the fact that daily allowable production of West Texas has been in excess of pipe-line outlet capacity of between 400,000 and 425,000 bbl. Even if the Gulf Coast storage could absorb the oil, facilities do not permit moving all the allowable production. An executive of one company estimated that present production is 10 to 15 per cent in excess of outlet capacity.

Boyd Declared Industry Has Made Enviable War Effort

WASHINGTON, D. C., Feb. 10.—The 15-billion dollar oil industry is supporting completely the government effort for an all-out victory, the nation was assured today by William R. Boyd, Jr., chairman of the Petroleum Industry War Council.

Mr. Boyd, in a statement issued at the council's headquarters, declared:

"Back in the peacetime days of last summer, when the nation still hoped it might escape the awfulness of war, the Office of Petroleum Coordinator made clear to the oil industry that there must be a tremendous increase in our production of 100-octane aviation gasoline in the interest of security.

"Accordingly, a far-reaching and comprehensive program of expansion was promptly launched. It was, in fact, a dual program entailing (1) immediate increases in capacity of existing facilities, and (2) the swiftest possible completion of new plants and additions. Both phases of the program have progressed with gratifying speed. Success of the first phase depended upon concerted action by many companies. The petroleum coordinator, therefore, obtained approval of the Department of Justice for such action, thus enabling companies to combine their production, refining and transportation facilities, and to sell, lend or exchange among one another their raw materials, blending agents, patents and processes. The increased production made possible by this cooperative action has been very substantial.

"The new construction program has been greatly expedited through the preparation, by the petroleum coordinator's staff, of model contract forms which met the approval of all the government agencies involved."

Ickes Urges Companies to Build Up Industrial Fuel-Oil Stocks

WASHINGTON, D. C., Feb. 9.—Prompt action by oil companies to build up stocks of industrial fuel oil on the East Coast has been requested by the Office of Petroleum Coordinator.

Deputy Coordinator Davies sent telegrams to the heads of 15 companies, calling attention to the declining stock position and urging the greater use of tankers, tank cars and other facilities in hauling industrial fuel oils used by war and other heavy industries to the Atlantic seaboard. He urged that facilities now being used to transport other petroleum products be converted to hauling the heavy industrial oils.

"We consider it imperative," the telegrams read, "that all tankers and other transportation facilities, scheduled to move gasoline and light products to the East Coast and suitable for conversion, should be immediately transferred to residual-fuel-oil service Gulf-East Coast, and kept in such service until East Coast residual-fuel-oil stocks again reach satisfactory levels."

Record Movement of Tank Cars to Atlantic Seaboard Reported

WASHINGTON, D. C., Feb. 10.—Tank-car movement of petroleum into the Atlantic seaboard territory from the West during the week ended January 31 totaled 5,125 cars, representing, on the basis of 225 bbl. per car, a volume of approximately 1,153,125 bbl., Mr. Ickes reported.

Previously, the greatest volume of tank-car movement to the Atlantic seaboard was during the week of October 18, 1941, when 4,396 tank cars were moved, representing a total volume of approximately 989,100 bbl.

The unprecedented tank-car movement during the week ended January 31 was in line with the request of Mr. Ickes that the fullest use of railroad tank cars and every other form of transportation be made to move petroleum to the East Coast to offset the diversion of a large part of the American tanker fleet for war and other essential purposes.

Tank-car shipments have mounted steadily since the week ended January 10, in which week 1,827 tank cars were moved. During the week ended January 17, movement totaled 2,410 cars, and during the week ended January 24 there were 3,410 cars. Extent of this tank-car movement is indicated in the fact that during the entire month of January 1941 only 560 bbl. of petroleum moved to the eastern seaboard by rail.

Plan Offered for Sharing Excess Shipping Costs

WASHINGTON, D. C., Feb. 10.—A formal recommendation authorizing a plan for sharing added costs of tank-car transportation in the Pacific Northwest was issued to the transportation committee of District 5 by OPC today. The recommendation, No. 35, directs the committee:

1. To prepare a plan "for the equitable distribution, among all persons affected, of the excess costs of transportation of petroleum and petroleum products in, to, or from the Pacific Coast area by railroad tank cars, or other alternative means of transportation, or any combinations thereof, over transportation by tanker under the Maritime Commission charter-rate ceilings."

2. Upon approval of the plan by the chief counsel, Office of Petroleum Coordinator, to carry it into effect in cooperation with all persons engaged in the petroleum industry who are or may be affected by an increase in the cost of transporting petroleum in, to, or from the district.

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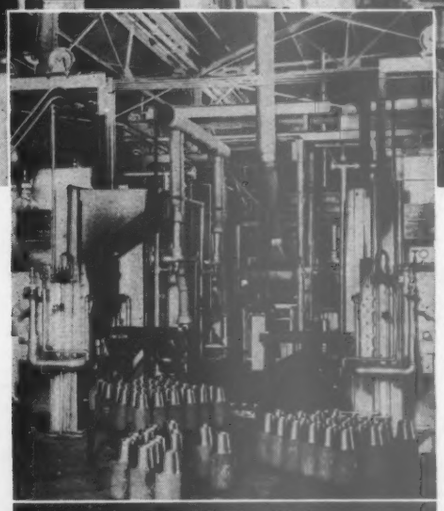

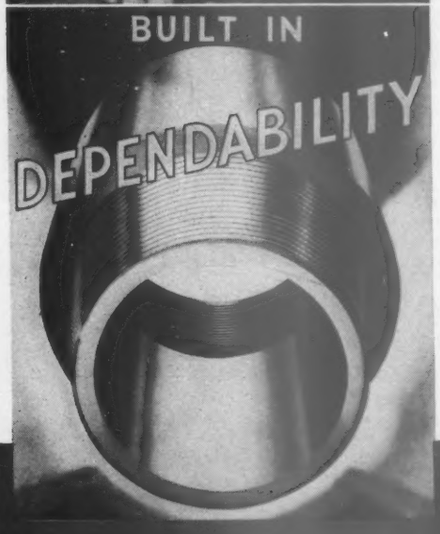

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Industry Will Oppose Efforts to Reduce Depletion Tax Allowance

WASHINGTON, D. C., Feb. 7.—The petroleum industry is preparing to make another defense of the depletion-tax allowance which appears certain to be attacked by the Treasury Department when hearings on the next general-tax bill open before the ways and means committee in the spring.

Declaration that the Treasury Department seeks to at least reduce the depletion allowance was made by Secretary Morgenthau earlier this month in an address at Cleveland, Ohio.

Oil men dealing with the depletion question are unprepared to discuss what defense the industry will make. They declare that the incentives that first caused Congress to extend tax protection to producers of irreplaceable and exhaustible resources are even more vital to national economy now than ever before.

Retention or possibly an increase in the allowance was one of the points urged in the Petroleum War Council earlier this month as an incentive that would maintain or increase the position of petroleum reserves.

Meanwhile, a request that the Treasury Department drop its attack on the oil-depletion allowable provisions of the revenue laws for the duration of the war was made to Secretary Morgenthau by Russell B. Brown, general counsel of the Independent Petroleum Association of America.

Mr. Brown's letter was in reply to a recent speech by the secretary in which he characterized the depletion allowance as a loophole for evasion of taxes, and compared it with the allowance for depreciation on machinery. Mr. Brown pointed out that many experts on taxation have approved the depletion allowance as proper when applied to oil and mineral producers, and that Congress has consistently refused to change this provision in spite of several requests from the Treasury that the allowance be eliminated. He declared that an attack on the depletion allowance at this time will interfere with efforts to produce petroleum for war purposes and that defense of the allowance would consume the attention of all oil producers which would otherwise be devoted to the war effort.

•

California Oil Men Seek State Aid in Sabotage Protection

LOS ANGELES, Calif., Feb. 10. — Warning that there is a well-organized plot to cripple the California oil industry by sabotage which awaits only the zero hour to be carried out, A. C. Rubel of Union Oil Co. and chairman of the State Oil Committee, at a meeting of the state Defense Council, the past week called upon the state for aid in patrolling oil-field districts and providing other protection.

Several attempts to sabotage California oil properties already have been made, Mr. Rubel revealed. He asked that certain areas be patrolled by state guardsmen and that some areas be closed entirely.

A. A. Jergins, representative of major oil companies on the state Defense Council, pointed out the dangers of sabotage faced by the oil industry. He said that high-pressure oil and gas fields, in which the destruction of any well might destroy the entire field, are in particular danger. Although wells are being sandbagged for protection, he pointed out, persons driving through fields easily could scatter incendiary bombs that might cause great damage.

Protection is needed first for marine terminals, pipe lines and storage, and then for the oil fields themselves, Mr. Jergins said. Radio cars should be on patrol day and night to cooperate with fields guards, he advised.

Frank W. Clark, vice chairman of the state Defense Council, assured the meeting that all state agencies, at the request of the Army, had been put on the alert to guard against sabotage between now and February 24, the deadline for alien evacuation of California defense areas, and that particular watch would be kept of oil properties.

It was revealed that oil companies are spending more than $2,000,000 annually to furnish protection within fields, but that it was felt the state should assume the responsibility for guarding entrances to fields.

•

Tanker Transfers Force Stocks Downward on East Coast

WASHINGTON, D. C., Feb. 10. — Petroleum stocks on the East Coast continue downward and the rate of decline has been accelerated in the past 3 weeks in which the submarine menace along the Atlantic shipping lanes has grown acute and since 25 tankers were transferred to the Pacific.

The Office of Petroleum Coordinator is no longer disclosing details of the East Coast petroleum stocks, taking the stand that such information might be of aid and comfort to the enemy.

Coordinator Ickes has sidestepped recent efforts to gain his declaration that an East Coast shortage is imminent or in prospect, probably avoiding the question because of the results of last summer's Maloney committee investigation. The Maloney committee was able to conclude, partially for the reason that its investigation closed about the time 40 tankers were returned by the British, that the East Coast shortage scare was fictitious.

At the time of the Maloney committee report, Coordinator Ickes said that he would not be inclined to warn of another shortage until it was in actual existence.

Additional evidence that the coastwise transportation situation is disturbing the East Coast supply of petroleum is given by the jam of stocks on the Gulf Coast. Appeals were received this week and last in the OPC from coastal refiners who reported their storage tanks full, inability to obtain tankers and warning that they were faced with compulsory shutdown of plants unless relief is forthcoming.

Will Use More Reclaimed Rubber in Tire Manufacture

WASHINGTON, D. C., Feb. 10. — Use of a higher percentage of reclaimed rubber in the manufacture of tires was authorized here last week by the War Production Board. This move will make no material change in the tire-rationing program, but it may tend to ease the interpretation on what services fall in the category of essential to the war program.

Robbins Opens Tulsa Office

Edward E. (Ned) Robbins, who was recently appointed director of the materials division for District 2 of OPC, will be located in Tulsa temporarily. His offices will be with the Tulsa Chamber of Commerce, Tulsa Building, Room 204. The phone number is 5-1201. Office facilities, including stenographic and clerical help, are being furnished by the Tulsa Chamber and the Mid-Continent Oil and Gas Association.

The temporary office was located in Tulsa at the request of Tulsa and Mid-Continent operators. Mr. Robbins will have full authority to countersign orders as provided by the P-98 of the War Production Board. The office was opened Monday, February 9.

THE MARKETS*

CRUDE OIL: Excess supplies reported at several points in Texas and Louisiana due to reduction in outlets, a development of the tanker shortage. One large buyer prorated West Texas and New Mexico purchases.

REFINERY PRODUCTS: Issuance of a formal price schedule by the Office of Price Administration governing sales of crude oil and all refined products followed downward adjustments in quotations for various products in a number of areas, principally on the Gulf Coast. Transportation difficulties continued to dominate trends with markets on the East Coast tightening in line with increasing depletion of supplies while on the Gulf Coast the situation became more critical on the other side because of piling up of stocks. California markets were featureless. Natural-gasoline prices in the southwestern and middle western states suffered additional sharp declines.

TANK-WAGON AND POSTED DEALER: Consumer buying being curtailed more noticeably in the denser populated areas although in many rural districts consumption is showing substantial increase. Price schedules as posted by the major sellers generally were unchanged but local adjustments due following issuance of formal price schedule by the Office of Price Administration.

FINANCIAL: Oil securities indicated very little change during the week, and closed at approximately the same average levels of the previous week. Average of 30 representative stocks for the week ended February 7: High, 23.90; low, 23.25; close, 23.47. Week ended January 31: High, 24.15; low, 23.25; close, 23.44.

*Detailed information in market section.

Price Schedule 88—

Petroleum and Products

Issued February 2 by Office of Price Administration.
Amendment printed at conclusion of order.

The production, refining and distribution of petroleum and petroleum products constitute one of the largest industries in the United States. Ample supplies of petroleum products are of prime importance to the armed forces and are equally essential to the industrial activity required by the war effort and to the civilian life of the nation. Inflationary increases in the prices of petroleum and its products will not only be multiplied in the whole structure of costs and prices; they will directly increase the cost of living and the burden of supplying the armed forces.

Price stabilization in the petroleum industry was initiated on the basis of informal agreements between the Office of Price Administration and members of the industry. The increasing scope of control and the growing multiplicity of informal agreements and understandings has made it necessary to embody these agreements and understandings in a price schedule. Such action will serve to clarify the price policies of this office as they affect the petroleum industry and to protect the industry and the public from the inflationary effects of unwarranted price increases.

Accordingly, under the authority vested in me by Executive Order 8734, it is hereby directed that:

1340.151 *Maximum prices for petroleum and petroleum products.*—On and after February 2, 1942, regardless of the terms of any contract of sale or purchase, or other commitment, except as provided in Section 1340.159(*a*)(1), no person shall sell, offer to sell, deliver or transfer petroleum or petroleum products, and no person shall buy, offer to buy, or accept delivery of crude petroleum at prices higher than the maximum prices set forth in Appendix *A* hereof, incorporated herein as Section 1340.159.*

*Sections 1340.151 to 1340.159, inclusive, issued pursuant to authority contained in Executive Orders 8734, 8875, 6 F.R. 1917, 4483.

1340.152 *Less than maximum prices.*—Lower prices than those set forth in Appendix *A* may be charged, demanded, paid or offered.*

1340.153 *Evasion.*—The price limitations set forth in this schedule shall not be evaded whether by direct or indirect methods in connection with a sale, delivery or transfer of petroleum products, or a purchase, sale, delivery or transfer of crude petroleum, alone or in conjunction with any other materials, or by way of any commission, service, transportation, or other charge, or discount, premium, or other privilege, or by tying-agreement or other trade understanding or by a change in the quality of a product, or otherwise.*

1340.154 *Records and reports.*—All purchase prices for crude petroleum as of October 1, 1941, whether or not such purchase prices were posted, shall be filed with this office within 30 days after the effective date of this schedule (Sections 1340.151 to 1340.159, inclusive). Purchase prices for crude petroleum described above may be submitted in the form of such price schedule or price lists as were in use on the dates specified, provided such price schedules or price lists are corrected to indicate any variance between the schedule or list price and the purchase price.

Where a contract was in effect as of October 1, 1941, for the sale of crude petroleum at the well in excess of the posted purchase price for the pool involved, duly authenticated copies of such contracts shall be filed with this office within 30 days after the effective date of this schedule.

Where maximum prices for any sale or purchase of crude petroleum or sale of petroleum products are not provided for in Section 1340.159, purchasers and sellers of crude petroleum and sellers of petroleum products shall, within 10 days after the purchase or sale in question, submit to this office the price and description of the crude petroleum or petroleum product in question.

Persons affected by this schedule shall submit such other reports to the Office of Price Administration and keep such records as it may, from time to time, require.*

1340.155 *Enforcement.*—In the event of refusal or failure to abide by the price limitations, record and report requirements, or other provisions of this schedule (Sections 1340.151 to 1340.159, inclusive), or in the event of any evasion or attempt to evade the price limitations or other provisions of this schedule, the Office of Price Administration will invoke all appropriate sanctions at its command, including taking action to see (*a*) that the Congress and the public are fully informed thereof; (*b*) that the powers of government, both state and federal, are fully exerted in order to protect the public interest and the interests of those persons who comply with this schedule; (*c*) that full advantage will be taken of the cooperation of the various political subdivisions of state, county, and local governments by calling to the attention of the proper authorities failures to comply with this schedule which may be regarded as grounds for the revocation of licenses and permits; and (*d*) that the procurement services of the Government are requested to refrain from selling to or purchasing from those persons who fail to comply with this schedule.

Persons who have evidence of the offer, receipt, demand or payment of prices higher than the maximum prices, or of speculation, or manipulation of prices of petroleum or petroleum products, or of the hoarding or accumulating of unnecessary inventories thereof, are urged to communicate with the Office of Price Administration.*

1340.156 *Modification of the schedule.*—Persons complaining of hardship or inequity in the operation of this schedule may apply to the Office of Price Administration for approval of any modification thereof or exception therefrom: *Provided,* That no application under this section will be considered unless filed by persons complying with this schedule.*

1340.157 *Definitions.*—When used in this schedule (Sections 1340.151 to 1340.159, inclusive), the term

(*a*) "Person" means an individual, partnership, association, corporation or other business entity, including all producers, refiners, marketers and others who buy, sell or exchange petroleum and who sell or exchange petroleum products, including specifically but not exclusively the following classes of persons:

- Crude-oil producers
- Crude-oil purchasers
  - Refiners
  - Pipe-line companies
  - Crude-oil purchasing companies
- Marketers
  - Integrated companies
  - Nonintegrated companies
  - Terminal operators
  - Distributors
  - Jobbers
  - Peddlers

(*b*) "Petroleum products" means:

All grades of gasoline, including natural gasoline and blending naphthas; also special hydrocarbon fractions utilized in the manufacture of gasoline or the components thereof
Liquefied petroleum gases
Tractor distillates and similar distillate type motor fuels other than gasoline
Kerosene, including range oil or stove oil
Distillate burning, heating or fuel oils
Diesel fuel oils
Residual burning, heating or fuel oils
Lubricating oils, including motor, aviation and stock oils (neutrals, bright stocks, steam-refined stock and other stock oils)

For the time being industrial lubricating oils, industrial naphthas and solvents, greases, and specialty products (such as household oils and spot removers) are excluded from the list of petroleum products subject to this schedule.

(*c*) "Pool" means any underground accumulation of crude petroleum or associated hydrocarbon substances, including but not limited to natural gas, constituting a single and separate reservoir or source of supply within a field, area, or horizon whether or not presently discovered or developed.

(*d*) "Consumer or commercial tank-wagon prices" means the prices at which petroleum products are sold for delivery by tank wagon or tank truck to the ultimate consumer of such products or to persons not primarily resellers of such products.

(*e*) "Contract" means an agreement, the existence of which is established by written evidence.

(*f*) "Dealer tank-wagon prices" means the prices at which petroleum products are sold for delivery by tank wagon or tank truck to resellers of such products.

(*g*) "Producer" means royalty owners or other sellers of crude petroleum at the well.

(*h*) "Producing well" means any well that has produced any crude petroleum during a period of 90 days prior to and including October 1, 1941.

(*i*) "Shut-in well" means any well that has not produced any crude petroleum during a period of 90 days prior to and including October 1, 1941.

(*j*) "Tank-wagon area" means the area in which petroleum products are distributed by tank wagon or tank truck from the given shipping point.*

1340.158 *Effective date of the schedule.*—This schedule shall become effective February 2, 1942.*

1340.159 Appendix *A. Maximum prices for petroleum and petroleum products.*—The maximum prices established by this schedule (Sections 1340.151 to 1340.159, inclusive) shall include the prices on all domestic, export and import transactions, sales, transfers, exchanges or purchases of crude petroleum and on all domestic, export and import transactions, sales, transfers or exchanges of petroleum products, involving contract, bid or spot sales of crude petroleum at the well, the gathering point, tank farm or terminal, and of petroleum products for cargo or barge shipment, harbor delivery, f.o.b. refinery and terminal, and tank car and tank-wagon delivery. Prices for petroleum products sold at retail at service stations, garages and stores are not governed by this schedule.

The prices on which this schedule is based are the prices after all usual discounts, such as those for quantity, prompt payment or ease of handling.

Except as specifically provided hereinafter, and pending the preparation of a comprehensive schedule or schedules of specific prices, the maximum prices for petroleum and petroleum products shall be the prices determined according to paragraphs (*a*) and (*b*) below.

(*a*) *Crude petroleum.*

1. The maximum price at the well for crude petroleum shall be the posted purchase price as of October 1, 1941, for the pool in which any given well is located; *provided,* that where a contract was in effect on October 1, 1941, for the purchase of crude petroleum at the well in excess of the posted purchase price for the given pool, such contract price shall be the maximum price at the well for any given well for the production covered by the contract, or any renewal of such contract, or a new contract between the same buyer and seller concerning the production from the same well.

2. Where, on October 1, 1941, there was in any given pool more than one posted purchase price or no posted purchase price, the maximum at the well for crude petroleum shall not be, for any given well, in excess of the price paid for crude petroleum from that given well as of October 1, 1941, unless this price is below the lower or lowest of the posted purchase prices, if any, and in that case the maximum price shall not be in excess of such lower or lowest posted purchase price; *provided,* that where a contract was in effect on October 1, 1941, for the purchase of crude petroleum at the well in excess of the posted purchase price for the given pool, such contract price shall be the maximum price at the well for any given well for the production covered by the contract, or any renewal of such contract, or a new contract between the same buyer and

(Continued on Page 78)

COMPLETE TEXT

The accompanying report gives the complete text, including amendments, of Price Schedule 88 for petroleum and petroleum products announced last week by the Office of Price Administration. A summary of the order was published in the February 5 issue of The Oil and Gas Journal, Page 24. A discussion of the order appears elsewhere in this issue.

Natural Gas News

Jersey Standard Will Divest Itself of Utility Companies

NEW YORK, Feb. 10.—Decision of the Securities and Exchange Commission that the Standard Oil Co. of New Jersey is a holding company within the meaning of the Public Utility Holding Company Act in so far as its ownership of four natural-gas utility companies is concerned, has been followed with an announcement by W. S. Farish, president of the company, that the company will divest of its stock ownership in these gas-utility companies.

The four companies concerned are East Ohio Gas Co. and River Gas Co., operating in Ohio; Hope Natural Gas Co., operating in West Virginia, and Peoples Natural Gas Co. in Pennsylvania. Holdings of these companies are valued at $220,538,000, with gross operating revenues amounting to $67,893,498. The companies serve 727,000 customers, and together comprise the third largest natural-gas system in the country.

The manner in which the company will dispose of its 100 per cent interest in the gas-utility subsidiaries has not been determined, but it is considered likely that the stock will be distributed pro rata to its own stockholders, or that a new holding company will be formed or one of the four companies designated as a holding company to assume ownership of the stock.

Under the SEC ruling, the company was called upon to dispose of its gas-utility holdings, or register as a public-utility company and become subject to the death-sentence clause of the act. Effective date of the ruling was set for August 4 to allow the company time to make adjustments.

In denying Standard's application for exemption, the commission point out that it was not the intention of Congress to exempt from the operations of the act a company which would otherwise be subject thereto, solely by reason of its "hybrid character."

Arkansas Louisiana Lays Line in Midway Area

Arkansas Louisiana Gas Co. is laying a 6-in. line from its 16-in. gas carrier a distance of 5 miles west to the new Midway Smackover lime pool in Lafayette County, southwestern Arkansas. The new deep pool, producing from the 6,500-ft. level, was opened by Barnsdall Oil Corp. 1 Bond.

Gas-Purification Plant Being Built at McKamie

McKAMIE, Ark.—McKamie Gas Cleaning Co. of Arkansas is building a gas-purification plant and gasoline-recovery unit in the McKamie field, Lafayette County. The purification plant, designed and being installed by Girdler Corp., Louisville, Ky., will purify and dehydrate 25,000,000 cu. ft. of condensate-separator gas daily.

This is the first purification plant designed to produce a marketable gas from this extremely sour gas field. The gas, which contains about 4,500 grains of hydrogen sulfide per 100 cu. ft. and approximately 5 per cent, will be purified to pass the sensitive Bureau of Standards tests for hydrogen sulfide. Incidental removal of carbon dioxide will increase the heating value of the gas.

The dehydration feature is being added to prevent hydrate formation in the transmission system. The plant will be complete, including steam and water-cooling facilities. Later facilities will be installed to convert the recovered hydrogen sulfide to elemental sulfur, sulfuric acid or some other useful product.

Border Pipe Line Seeks to Export Gas to Mexico

The Federal Power Commission announced receipt of an application from the Border Pipe Line Co., Houston, Tex., for authority to export natural gas from the San Salvador field in Hidalgo County, Texas, for use by the American Smelting & Refining Co. in its zinc smelters at Rosita, State of Coahuila, Mexico.

The applicant proposed to sell the gas at a point on the international boundary approximately 40 miles northwest of Laredo.

Gas Production in Kansas Reaches All-Time High

Natural-gas production in Kansas reached an all-time high in 1941 when 93,426,773,000 cu. ft. were reported, an increase of 7,808,988,000 cu. ft. over 1940. The principal increase came from the Cunningham field where production rose over 50 per cent. Hugoton's output was 9 per cent greater than in 1940.

Production from the old fields in the eastern part of the state declined but more than half of this decline was offset by production from the newly discovered McLouth field in Jefferson County. With the exception of scattered gas production in Barton, Ellsworth and Rice counties production from all but four fields declined. These four fields, Hugoton, Cunningham, Thurber and McLouth, now produce about 55 per cent of Kansas' gas.

KANSAS NATURAL-GAS PRODUCTION PREPARED BY CONSERVATION DIVISION, KANSAS CORPORATION COMMISSION

(In thousands of cubic feet)

Field—	Year— 1940	1941	Increase or decrease
Burrton	4,674,845	4,533,164	—141,681
Cunningham	11,934,153	17,995,846	6,061,693
Hollow	190,318	103,013	—87,305
Hugoton	33,126,801	36,410,275	3,283,474
Lyons	2,955,567	2,422,392	—533,175
McCarty (Edwards County)	33,966	12,611	—21,355
McLouth	0	1,667,101	1,667,101
McPherson County	5,122,903	4,175,090	—947,813
Medicine Lodge	7,675,935	7,092,500	—583,435
Misc. Barton County	(*)	201,805	(*)
Misc. Cowley and Sumner counties	542,908	370,732	—172,176
Misc. eastern Kansas†	6,872,452	4,000,000	—2,872,452
Misc. Ellsworth County	(*)	24,083	(*)
Misc. Rice County	(*)	11,901	(*)
Orth	674,898	519,515	—155,383
Otis	9,709,901	8,988,337	—721,564
Schrader (Elk County)	447,627	379,810	—67,817
Sperling	59,960	34,956	—25,004
Thurber (Alden)	405,805	3,358,303	2,952,498
Wellington	639,809	696,832	57,023
Yoder	471,285	428,507	—42,778
Misc. western Kansas	78,652	.....	159,137
Total	85,617,785	93,426,773	7,808,988

*Included with miscellaneous western Kansas. †Partly estimated.

Pennsylvania Gas Buys Warren County System

Sale of Warren County Gas Co. pipe lines in Sheffield, Saybrook and Tiona, Pa., to Pennsylvania Gas Co. has been completed and more than 400 consumers in these communities are now being served by the new operator. Warren County Gas Co. was a subsidiary of Kane Gas Co.

Under terms of the transaction, the purchaser took over several miles of street pipe lines in the three communities and a 4-in. line extending from Sheffield to Tiona.

Britain's Civilian Defense Described for Utilities Groups

Davis M. DeBard, vice president of Stone & Webster Service Corp., New York City, in an Oklahoma speaking tour, gave a first-hand account of Britain's defense efforts since the outbreak of the war. Among those who heard his presentation were members of the Oklahoma Press Association, Oklahoma Natural Gas Co. employes, representatives from electric, telephone, water and transportation utilities—civilian-defense leaders, members of various city councils, and the chiefs of the fire and police departments and their key men, and the State Highway Patrol.

●

Amendment to Asphalt Price Ceiling Permits Increases

WASHINGTON, D. C., Feb. 10.—Price increases for asphalt and asphalt products are permitted in an amendment to the asphalt price ceiling issued today, and effective February 9, Price Administrator Leon Henderson reported.

Maximum prices for roofing flux east of the Rocky Mountains were increased 75 cents per ton over contract prices made January 1, 1941, and $1 per ton upward for the same products sold west of the Rockies.

The new ceilings range from $7.25 per ton for refineries on the West Coast to $12.25 for refineries within 100 miles of the Atlantic Coast.

It is provided that maximum prices for paving asphalt, cut-back asphalt, asphalt emulsion and road oils be determined upon the basis of the weighted average of prices provided in the three contracts of sale governing the largest volume made between July 1, 1941, and October 15, 1941, for a product of like specifications and quality shipped to the same destination.

Natural Gasoline

Warren Nearing Completion Of Two Gasoline Plants

By February 15 Warren Petroleum Corp. expects to have in operation its new 30,000-gal. natural-gasoline plant at Madill, Okla. Its new combination gasoline and repressuring plant under construction near Crossville, Ill., is also progressing but its completion date remains less definite.

At the Madill plant the company is installing complete fractionating equipment for the removal of isobutane.

Texhoma Company Completes Booster and Recovery Plant

AMARILLO, Tex.—Texhoma Natural Gas Co. has completed a new booster plant, including dehydration and gasoline-extraction units, in the Moore County oil and gas field, 17 miles east and south of Dumas. The plant is on the company's 26-in. trunk line from Texas and Kansas fields to Detroit, Milwaukee and other large centers in the north and east.

On to Victory through

Tunnels of Steel

Restrict the flow of oil, gas and gasoline and our war energy would be crippled. For every ship, plane, tank and truck needs fuel to go into action—every armament industry needs gas to keep production rolling.

The problem is to get as much of these fuels from wells to point of use as quickly as possible. More pipe lines will help—pipe lines of Steel.

As the world's largest manufacturer of electric weld line pipe, casing and tubing, Republic knows its responsibility to deliver the pipe needed. Capacity has been increased—and, today, tubular goods are being produced in quantities greater than ever before.

Republic's 71,000 men in 65 plants and mines are working at top speed to live up to Steel's obligation as a partner of Oil and Gas in *Production for Victory.*

Have you a copy of "The Pipe of Progress," the 44-page book that tells the complete story behind the outstanding quality of Republic Electric Weld Line Pipe, Casing and Tubing? Every oil and gas producer should have one. Write for yours, today.

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Other products include Sheets and Plates—Upson Bolts, Nuts and Rivets—Electrunite Heat Exchanger Tubes

ENGINEERING AND OPERATING SECTION

FEBRUARY 12, 1942

Central Separator Provides Flexible Control at Paradis

By NEIL WILLIAMS

One battery of separators is being used by the Texas Co. for handling the production from 18 flowing wells on its L. L. & E. Paradis lease in the Paradis Louisiana, field. The lease is still under development and the present facilities will care for additional wells completed. The manifolding of the separators is such that individual production tests can be run on a well while the others are flowing.

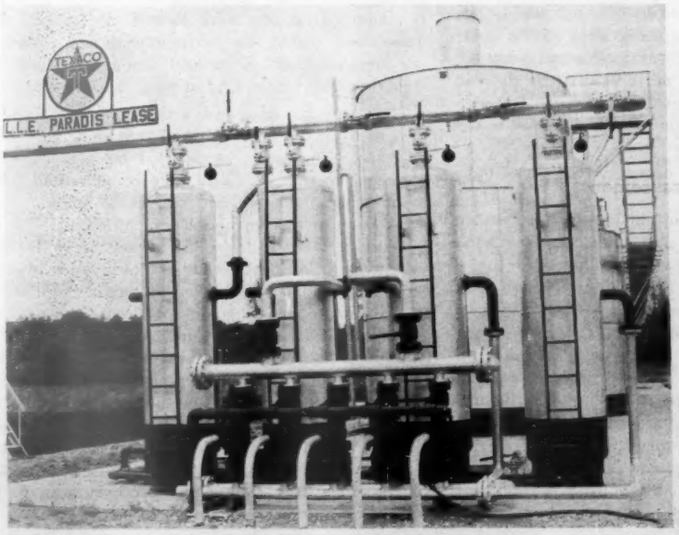
A CENTRALIZED lease separator and tank-battery installation that combines a high degree of flexibility in flow control with compactness in layout, with a minimum of piping and comparative simplicity in operation, is serving the Texas Co.'s sizable L.L.&E. Paradis lease in the Paradis field, St. Charles Parish, Louisiana Gulf Coast. Eighteen wells have been completed on the lease to date, the production of which is being handled through the single installation, which has capacity for additional wells as drilled.

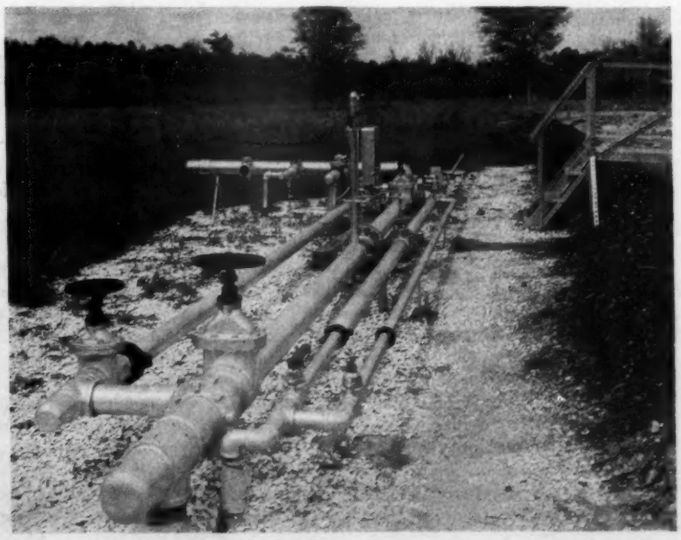
Location of the installation is on a comparatively high and dry site adjacent the low-lying marshes which cover much of the present productive area of the lease and field. There it is somewhat removed from the majority of wells it serves, necessitating long flow lines from the field. However, by not locating the battery at a more central location in the field the operators avoided the necessity of providing piling or matting foundations. At the same time it is convenient to the company's field office and pipeline station located nearby.

The hookup and layout of the installation are shown in the accompanying pictures. Manifolding for flow control to the separators is shown in Fig. 1. There are five 3-in. flow lines from the lease. These are laid through the field along the plank roadways that lead to the various wells. Separators in Fig. 1 are, left to right, a stripping separator for vent gas from the other separators; two regular production separators, and an individual well-testing separator. However, operation of the separators for these purposes can be varied in several combinations.

Manifolding is such as to permit the production flow in any of three different ways, or combinations. First, the production from any or all field flow lines can be run to the testing separator. At the same time all production from any or all flow lines can be run to either of the two regular production separators or to both of the latter separators simultaneously. Also, the producion can be split with the flow from any combination of lines being run to one of the separators while that of

Fig. 1 (left)—Separator and manifold installation on the Texas Co.'s L. L. & E. Paradis lease in the Paradis field, St. Charles Parish, Louisiana Gulf Coast. Fig. 2 (right)—Gas-measuring manifold installation





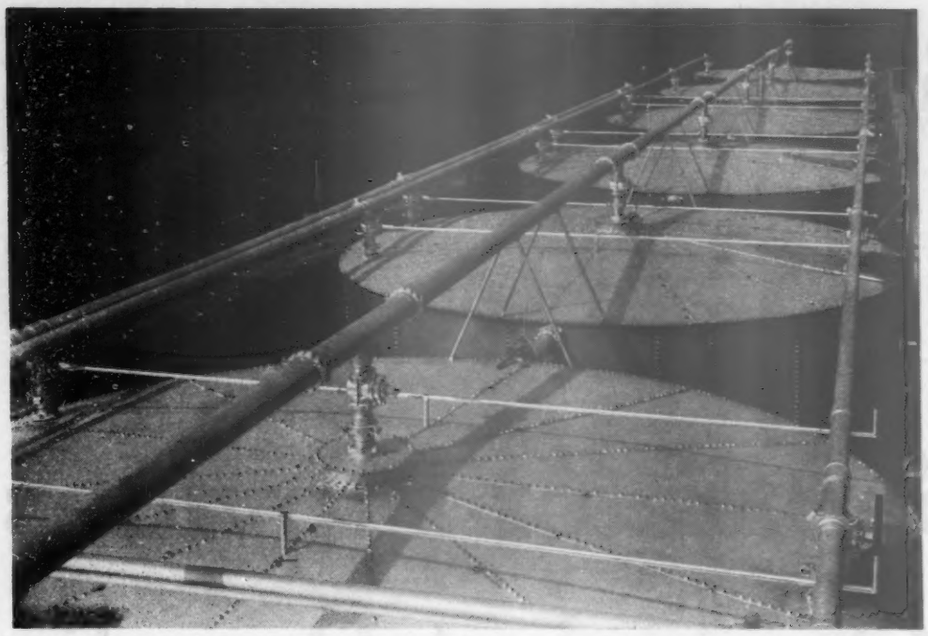


Fig. 3—Stock-tank installation in the Texas Co.'s central-lease battery in the Paradis field, showing production-line connections. View taken from top of gun barrel

any or all the remaining lines is run to the other separator. When testing separator is not needed for individual well gaging, it also can be used for regular production.

Individual Testing Separator

All wells on the lease are completed and tested through the central individual well-testing separator. Also, all periodical testing of completed wells is done in the same manner, including potential taking and gas-oil ratio checks. When it is desired to test a well, the production of that well is run to the testing separator by opening the valve to the individual gage line (3-in. line at bottom in front) to the testing separator and closing valves to other outlets. Fluid from the bottom of this separator is discharged to a 4-in. line (line at right, Fig. 3) having connection with both the gun barrel and each of the six 1,000-bbl. stock tanks. The vent gas from this separator can be passed either to the individual gage metering line (in the rear of main vent line) or to the main vent line.

The 2-in. black-painted manifold line above the five incoming flow lines is a "popoff" line. Each flow line has a popoff-valve connection to this line which discharges to the first of the six 1,000-bbl. stock tanks. The popoff manifold provides relief to bypass the separators in the event any valve to other lines should close and build up back pressure on incoming flow lines. Also, the flow of any line can be bypassed around the separators.

Regular production can be flowed either to the 4-in. manifold line at the top of the production manifold or to the 4-in. manifold line at the bottom (behind the individual gage line) which discharges only to the second regular production separator (third from left). If it is desired to flow all production at the same time to either or both of the regular production separators the upper 4-in. manifold line can be used. Also all production can be discharged to the second regular production separator by the lower 4-in. manifold line if desired. If it is desired to split the production and operate the two regular production separators individually, which would be the case if two different types of crude were being handled, the production of wells to be handled by the first regular production separator can be flowed to the upper 4-in. manifold line with its outlet to the second production separator closed; the remainder of the production would be flowed to the second production separator through the lower 4-in. manifold line.

In normal practice, vent gas from production separators is passed to the stripper separator (first separator from left) which traps any liquid or spray that might be carried over from the other separators. However, this separator can be bypassed if desired. Any liquid accumulation trapped in this separator is discharged to the popoff manifold line. Valves placed in the main vent line between each separator permit the control of direction of vent gases either to the main gas discharge outlet or through the individual well-metering manifold.

Fig. 3 shows manifold connection to the tops of the stock tanks, looking down from the top of the gun barrel. The 4-in. line at the right is the individual gage line from the testing separator with connections to each of the tanks as well as the gun barrel. The 6-in. line in the middle is to carry off vent gases from the tanks to the flare or for any desired use. The two 4-in. lines on the left are the regular production lines, one from each of the regular production separators. Discharge valves on each of these lines to the tanks are opened or closed by remote-control arms extending across the tops of the tanks to the catwalk side, which eliminate the necessity of operators climbing across the tanks to operate the valves.

Gas Measurement

The gas-measuring manifold installation located at the central separator and tank battery site is shown in Fig. 2. The center 6-in. line is for regular gas production from the main separator vent line. The 4-in. line at the left is a bypass around the metering hookup. The 2-in. line to the right of the main 6-in. line is for measuring gas from the testing separator in individual well gaging. It also has a bypass around the meter. The orifice flange connection on the individual well measuring line is so manifolded with that of the 6-in. main line that a single meter serves for measuring the gas through both lines. All gas produced on the lease is measured. A gas regulator valve at the end of the 6-in. manifold line maintains a constant back pressure on the system. The measuring lines discharge to a 6-in. manifold which controls the distribution of gas for field use or to the flare.

The entire separator and tank battery installation is set up on a single, solid reinforced-concrete base, which not only provides a substantial, permanent foundation but facilitates maintenance and adds to the general orderly appearance. All valves and controls are readily accessible, permitting ease of operation. An adequate fire wall is maintained around the site and other necessary safety precautions provided.

●

Questions and Answers

What procedure is followed in destroying the wells in the East Indies so they will be useless to the Japanese invaders and yet can be reopened after the enemy has been driven out?—R. P.

The procedure being followed is undoubtedly a military secret and there has properly been no announcement of the method used. Actually the success of such a procedure would depend on keeping the method secret from the enemy. However, there are general procedures which could be used depending on the material available, the time allotted to do the work and the foresight in preparing the wells for such an emergency.

If time were available, special tools could be installed and the placing of the well in an inoperative condition would then be a matter of moments. If sufficient thought were given to this subject the well could be fixed so that it would be virtually impossible to reopen it even after a rig had been placed over the hole. In fact, it would be much cheaper to simply drill new wells.

On the other hand, reopening the wells by men who knew the combination would be only a matter of a few hours, although there would have to be a machine of some type moved in for the work.

The destruction of these wells practically means the creation of an artificial fishing job. The greatest factor in the successful completion of a fishing job is the knowledge of exactly what is in the hole. It is not difficult to imagine the difficulties of fishing when the diameter of the fish, its design and its position in the hole are unknown. Just finding out what tools to run in an effort to get the fish would be a long and tedious process. If some obstruction were lodged in the well, its dislocation would be extremely difficult unless the men working on the well knew how that obstruction was placed and of what it consisted.

There are so many ways the complete shutoff of a well can be accomplished that they need not be listed. The wells could also be permanently damaged so that it would take considerable time to put them in condition to operate again. However, it doesn't seem necessary to do this.

Actually, what is desired is to put the wells into such a condition that, as far as the invader is concerned, it would take longer to repair them than to drill new ones. The only thing the Japanese get in such a case is the knowledge where oil can be found. They then have to drill the wells and equip them. As the Japanese do not have much drilling machinery and are believed to have a limited number of workmen skilled in petroleum work, it would take at least 6 months for them to get any production out of the ground and several years before they could drill, produce, transport, and refine any sizable amount of crude.

Preparation of Methyl Chloride From Natural Gas*

Thousands of tons of methane are produced annually in the form of natural gas. Obviously, this would make a cheap and plentiful hydrocarbon for the preparation of many more complex hydrocarbons of commerce. Here the research work of a Russian laboratory is summarized, in which the operator replaced one of the hydrogen atoms in the molecule with chlorine to make methyl chloride, the material which could serve as a reactive base component for preparing hundreds of such compounds.

PREPARATION of methyl chloride by the chlorination of natural gas has been investigated. Unlike previous studies a precise method of analysis of methyl chloride was used. The following was established:

1. At 350°-500° in the presence of the proper catalysts 80 to 85 per cent of the chlorine passed and of the reacted methane are consumed in formation of methyl chloride. Of the condensate 80 to 86 per cent boils within —25° and —23° and consist of chemically pure methyl chloride. A reduction of the temperature brings about a sharp decrease of the reaction velocity constant, and at a reaction temperature of 300°, 93 per cent of the condensate consists of chlorine.

2. Among the investigated catalysts cupric chloride on pumice, cupric chloride promoted by cerium chloride, iron shavings and aluminum shavings exert the most favorable effect. At 450° and a ratio of methane to chlorine of 9.4 : 1.82 the condensate consists of methyl chloride to the extent of 87 per cent.

3. The reaction takes place equally well within a wide interval of contact periods of from 0.5 to 40 seconds; within these limits a decrease of the contact period brings about an insignificant increase of the yield of methyl chloride.

4. The yield of methyl chloride is directly dependent upon the proportion of the gases. The above indicated yields are obtained with a ratio of methane to chlorine of 10 : 1. With decrease of the volume of methane the yield of methyl chloride decreases and the amount of polysubstituted derivatives of methane increases. With a 2 : 1 ratio of methane to chlorine more than 50 per cent of the condensate consist of higher chlorine derivatives of methane.

5. Under the established conditions of the highest formation of methyl chloride the waste gases consist entirely of methane and may be recirculated.

6. When natural gas is used containing higher hydrocarbons, the content of methyl chloride amounts to 75 to 79 molar per cent on the total volume of chlorine derivatives. Since higher hydrocarbons are condensed simultaneously with methyl chloride the separation of the hydrocarbon part from methyl chloride requires special equipment. For this reason the higher hydrocarbons, if present, should be preliminarily removed from the gas.

7. The enormous economic significance of methyl chloride and the completeness of the developed process of the preparation of methyl chloride from natural gas requires its adaptation using large-scale experimental installations.

Among the many studies[1] on the reaction of chlorine with methane published during the past 80 years and since that reaction was discovered by Dumas, the majority deal with all chlorine derivatives of methane, although methyl chloride and carbon tetrachloride are of much higher importance than the rest. Having dealt with the second product in their previous study, the authors now investigated formation of methyl chloride. The published research[2,3,4,5] on this subject is inconsistent and high yields are achieved by high dilution of methane with nitrogen which limits the practical value of the results. No exact analyses of the reaction products were given.

In the present study natural gas from a field 70 km. from Baku was used, the contents of which as analyzed by the methods of Sokolov and of Hempel is reported in Table 1. Commercial chlorine was used.

The chlorination apparatus is shown in Fig. 1. The natural gas and the chlorine were passed through sulfuric acid and calcium chloride, after which they were mixed and passed into the reaction vessel. This could be a Pyrex glass, quartz or metal tube. It is kept in an electrically heated furnace fitted with a thermocouple. The entire heated portion of the reaction tube was filled with the catalyst. Upon leaving the reaction tube the gas was washed with ice-cooled water to remove the entire hydrogen chloride, passed through calcium chloride into a petroleum ether bath, cooled with liquid air to from —130° to —140°, and passed out of the apparatus. Adsorption with activated carbon was found by experiment also to retain the methyl chloride. Three-way stopcocks were used for sampling. The reactor was heated to the necessary temperature, after which the gas mixture was passed into it at a regulated rate of flow; after a lapse of 15 minutes from the beginning of the experiment the gas was directed to the condensation equipment.

Limitation of Methods

Several methods of analysis of the reaction products were tested. The method of Roka and Fuchs[6] was found to be of limited use due to the volatility of the methyl chloride under the conditions used. Other methods[7,8] were also unsatisfactory because of a large fluctuation in the results. Distillation in a Podbielniak apparatus was found to give very exact results. The specific gravity of the waste gas and of methyl chloride were determined from time to time. The wash water was also analyzed for hydrogen chloride.

Temperature.—The basic series of experiments was carried on at 400°-450°. At temperatures below 350°, even in the presence of a substantial excess of methane, chlorine does not completely react, and the yield of methyl chloride is greatly reduced. At higher temperatures methyl chloride and methane are decomposed and the catalyst is poisoned. Fig. 2 shows the results of these experiments. In this series of experiments cupric chloride on pumice was used as a catalyst. The pumice was previously treated with nitric acid.

TABLE 1—PER CENT BY VOLUME

Gas—	Methane	Ethane	Propane	Butane	Higher	CO_2	Air	Sp. grav. (pycnometer)
Miadzhik well No. 9	99.7	0.3	0.3	..	..	None	None	0.5592
Miadzhik well No. 16	99.8	..	0.2	..	..	None	None	0.5590
Chernogorodsk gas main	91.3	2.3	1.1	..	0.8	2.6	1.9	0.626

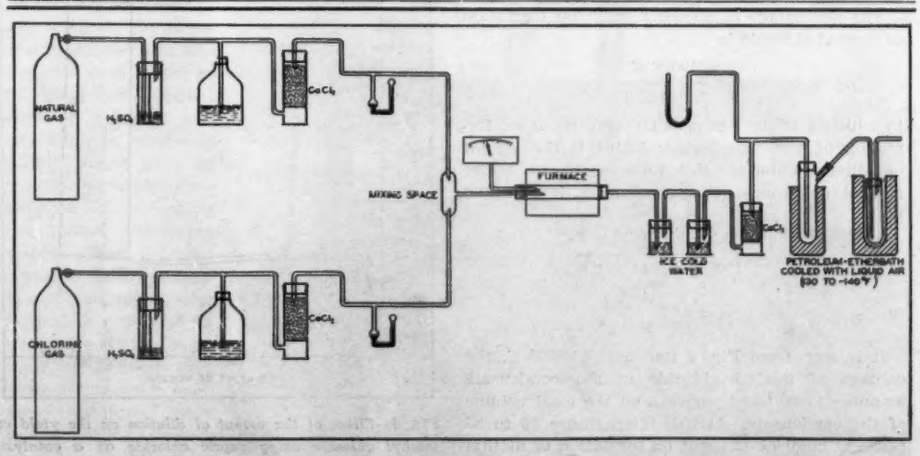


Fig. 1—Layout of laboratory equipment for the preparation of methyl chloride from natural gases

*Translated by J. G. Tolpin of Universal Oil Products Co. from the "Zhurnal Prikladnoi Khimii," Vol. 12, No. 12, as originally prepared by Yu. G. Mamedaliev, V. V. Dement'eva, A. M. Kuliev and A. A. Bakhshiev of the Azerbaidzhan Petroleum Research Institute and except for minor sections supplied by the translator to promote clarity. Submitted by the Petroleum Division of the American Chemical Society through the foreign petroleum literature survey of Universal Oil Products Co. The facts and opinions presented are solely those of the authors cited in the references, and the Petroleum Division and Universal Oil Products Co. do not necessarily endorse the statements made. Temperatures shown here are expressed in degrees C.

After deposition of cupric chloride, it was dried at 110° and then at 200° for 2 hours in an atmosphere of nitrogen.

The temperature was measured with a platinum-platinum-rhodium thermocouple kept inside the reactor. The fraction boiling up to —25° consists of methane dissolved in methyl chloride and partly of methyl chloride. The fraction boiling from —25° to —22° consists entirely of chemically

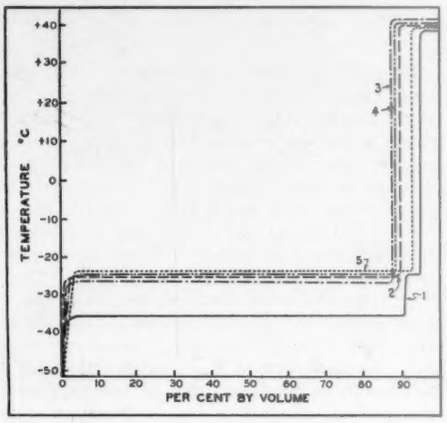


Fig. 2—Effect of the temperature of chlorination upon the yield of methyl chloride. Temperature: 1—300°; 2—350 ; 3—400°; 4—450°; 5—600°

pure methyl chloride. The intermediate fraction (from —20° to +20°) is very small showing an ideal performance of the distilling column and the absence of ethyl chloride. The fraction boiling above 20° consists basically of methylene chloride. This fraction was in some cases isolated and distilled under a dephlegmator packed with glass rods. The basic portion of the liquid boiled within 40°-45°.

Methyl Chloride Yield

The percentage by volume was determined by Podbielniak distillation. The percentage by weight was calculated from the composition by volume and the specific gravities of the fractions. The yield of methyl chloride on the chlorine based is calculated from the formula

$$C = \frac{A \times 70.28 \times 2}{100}$$

in which C indicates the number of grams of chlorine spent on formation of methyl chloride; A, number of grams of methyl chloride determined from the total weight of the condensate and percentage of methyl chloride in it; 70.28 per cent is the per cent chlorine in methyl chloride and 2 is the index of substitution.

The percentage of chlorine spent on formation of methyl chloride is

$$x = \frac{100 \times C}{3.2164 \times V}$$

in which x is the per cent chlorine spent on formation of methyl chloride; 3.2164 is the weight of a liter of chlorine; V, volume of chlorine under normal conditions. By substitution, it is found that

$$x = \frac{100 \times A \times 70.28 \times 2}{100 \times 3.2164 \times V}$$

or

$$x = 43.7 \frac{A}{V}$$

It is seen from Fig. 2 that at 400°-500° C. the content of methyl chloride in the condensate amounts to 80 to 86 per cent on the total volume of the condensate. At this temperature 80 to 85 per cent chlorine is spent on formation of methyl chloride and only 15 to 20 per cent on formation of methylene chloride. Since methane enters no other reaction under these conditions but chlorination, the yield of methyl chloride on the consumed methane is also not less than 80 to 85 per cent. This is confirmed by the composition and amount of the remaining gas. The remaining gas consists of pure methane and the decrease of volume of the passed methane is equivalent to the volume of the consumed chlorine. At 450° the remaining gas contains no chlorine at all. Even sensitive reagents show no traces of it. At 400° traces of chlorine are found and at 300° the condensate is yellow in color and contains a large amount of it.

Tests at Different Rates

Contact period.—Experiments at different rates of flow of the gas in tubes of different diameters were performed. Since no change of the volume of the reacting mixture takes place in the reaction, the contact period was determined simply by dividing the volume of the reaction tube by the consumption of the gas mixture per second, with corrections for the temperature. The results are shown graphically in Fig. 3. A decrease of the contact period from 40 seconds (the contact period at which all experiments of Mario Giordani[4]

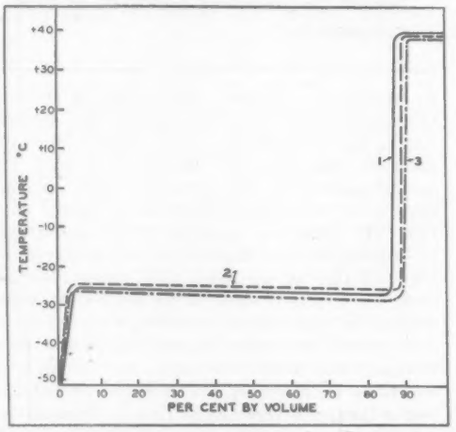


Fig. 3—Effect of the contact period on the yield of methyl chloride. Contact period: 1—18.5 sec.; 2—10.0 sec.; 3—0.51 sec.

were carried out) to 0.5 second showed no sharp changes in either the content of methyl chloride in the condensate or its yield.

Dilution.—The ratio of chlorine to methane is one of the basic factors in formation of the chlorinated-methane derivative aimed at. It was shown in the previous investigation that an ex-

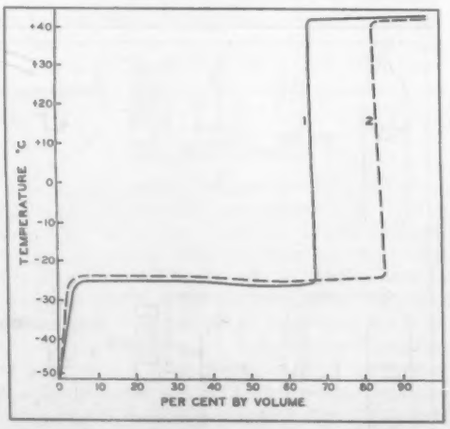


Fig. 4—Effect of the extent of dilution on the yield of methyl chloride using cupric chloride as a catalyst. Dilution: 1—1:5; 2—1:9.4

cess of chlorine brings about formation of carbon tetrachloride. With a methane-chlorine ratio of 1:1, a mixture of all four chlorine derivatives is formed. Results of a series of special experiments designed to clarify this point are shown in Figs. 4 and 5. All of these experiments were carried out at 450°. The volume proportion of gaseous components in the reaction is seen to be the most important factor determining the yield of the individual chlorine derivatives of methane. With a methane-chlorine ratio of 10:1, the condensate consists of methyl chloride to the extent of 80-85 per cent. With a decrease of this ratio, the content of methyl chloride is reduced in proportion and reaches 30 per cent when the methane-chlorine ratio falls to 1:1. Equivalent amounts of chlorine and methane were diluted with inert diluents, carbon dioxide and nitrogen. However, experiments showed that these diluents have no advantage over methane and constitute only a drawback.

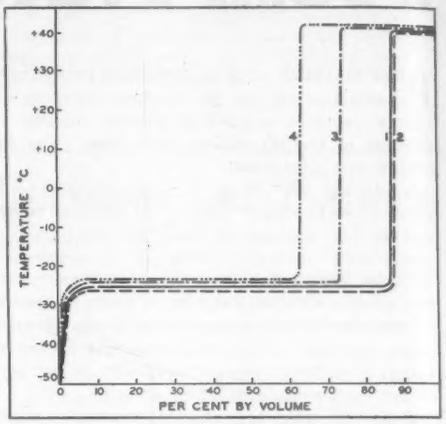


Fig. 5—Effect of dilution on the yield of methyl chloride using iron as a catalyst. Dilution: 1—1:12.5; 2—1:19; 3—1:5; 4—1:3

Catalysts.—Mario Giordani used only copper chloride promoted with cerium chloride. He ascribes a high yield of methyl chloride to the special effect of cerium chloride. In the experiments under report copper chloride promoted with cerium chloride showed no advantage over copper chloride, as seen from Fig. 6 reporting experiments at 450°.

Cupric Chloride Catalyst

In this series of experiments, the catalyst cupric chloride promoted with cerium chloride was prepared according to Mario Giordani[4]. Curve 1 shows experiments with cupric chloride deposited on pumice previously treated with nitric acid. For

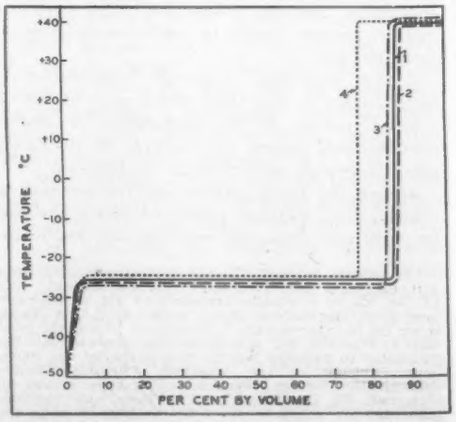


Fig. 6—Effect of catalysts on the yield of metal: 1—Cupric chloride; 2—Iron; 3—Aluminum; 4—Silver

TABLE 2

Catalyst—	Contact period, seconds	Composition of the condensate, % by volume: Hydrocarbons	Chlorine	Methyl chloride	Higher chlorinated products	Composition of the chlorinated compounds, per cent, by volume: CH_3Cl	CH_2Cl_2, C_2H_5Cl and higher chlorides	Remarks—
Cupric chloride on pumice	0.5	18.5	0.0	64.5	17.0	79.0	21.0	
	0.5	25.0	0.0	56.8	18.2	75.7	24.3	
	18.5	38.4	0.0	44.0	17.6	71.5	28.5	
	18.5	29.0	0.0	50.6	20.4	71.3	28.7	
	18.5	14.9	0.0	50.4	24.7	71.0	29.0	
Iron shavings	8.2	53.7	5.3	31.6	9.4	77.0	23.0	After 2 hr.
	8.2	54.5	24.4	12.3	8.8	58.3	41.7	After 12 hr.

the precipitation of cupric chloride on the pumice, a concentrated solution of copper chloride was used. The catalyst was dried at 110° and heated for 2 hours in a stream of nitrogen at 150°-200°. The experiments shown by curve 2 were carried out in the presence of iron shavings packed into an iron tube. The experiments indicated by the curve 3 were carried out in the presence of aluminum shavings. Silver was deposited by repeated chemical precipitation on copper shavings used for the experiments reported by the curve 4.

In the experiments with copper shavings in a copper tube, no positive results could be obtained because of rapid corrosion of the copper tube.

In addition to the above catalysts activated carbon, silica gel, chlorinated kaolin and also barium chloride and calcium chloride deposited on chlorinated kaolin, as well as other catalysts were tested, but found to give in all cases considerably lower yields of methyl chloride. In the case of cupric chloride, promoted with cerium chloride and unpromoted, the content of methyl chloride in the condensate, under complete utilization of the chlorine, fluctuated in both cases within the same limits, 83-85 per cent. Use of iron increases the yield of methyl chloride by 1-2 per cent. Besides the catalytic action of iron, the difference in the heat conductivities of the iron and glass tubes apparently also favorably influences the yield of the final product.

All these experiments were carried out with natural gas containing 99.7-99.8 per cent of CH_4. The exceedingly low content of intermediate fractions boiling at from —20° to +20° and the complete absence of ethyl chloride (boiling at from 10° to 20°) is noteworthy. It indicates the absence of side reactions observed by other writers[8] under conditions similar to those reported here. These reactions should have caused first of all the formation of ethyl chloride:

$$CH_4 + CH_3Cl = C_2H_6 + HCl;$$
$$C_2H_6 + Cl_2 = C_2H_5Cl + HCl:$$
$$CH_2Cl_2 + CH_4 = C_2H_5Cl + HCl.$$

Composition of Natural Gas

Experiments with gas from the Chernogorodsk gas main, the composition of which is shown in Table 1, were carried out at 450° C., using a methane-chlorine ratio of 9.4:1. The obtained results shown in Table 2 revealed that in the presence of higher hydrocarbons the homologs of methane are also condensed with chlorinated products, and for this reason the content of methyl chloride in the condensate is lowered. However, if the hydrocarbon portion is excluded from the composition of the condensate, a yield of methyl chloride within 80-70 per cent by volume is obtained in the presence of copper chloride. The presence of methane homologs in the initial gas facilitates the formation of chlorine derivatives of ethane, propane, and other higher hydrocarbons and increases the amount of higher chlorine derivatives in the condensate. The excessive increase of the yield of higher chlorine derivatives with rise of the content of methane homologs in the initial gas indicates a certain selectivity of the reaction of chlorination of saturated hydrocarbons. The distillation curve indicates that in some experiments, the content of ethyl chloride reached 5 per cent on the condensate.

Unlike the experiments with pure methane, the experiments with natural gas resulted in exceedingly low yields of methyl chloride when iron was used as a catalyst. Notwithstanding the high excess of methane, the condensate contains marked amounts of chlorine. With increase of the period of use of the catalyst, the content of chlorine in the condensate increases. At 450° iron promotes the thermal decomposition of methane homologs and is poisoned by the products of decomposition. In work with pure methane, the catalyst is not poisoned because of the thermal stability of methane.

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Exhaustive Tests Performed on Oklahoma Pumping Well

STRAIN gages, dynagraphs, electrical instruments, and two nine-element oscillographs were used recently in making records of over 200 operating conditions of the pumping apparatus on a 3,500-ft. Oklahoma oil well. The tests were conducted cooperatively by the Phillips Petroleum Co., Sargent Engineering Corp., and Westinghouse Electric Co.

The tremendous mass of data compiled during the tests is now being completely analyzed. Indications are that formulas for peak pumping-rod loads, peak torques, and plunger strokes will be revised. It is hoped that proper drive, stroke, and speed for pumping wells can be selected for a particular well ahead of the time when the well must go on the pump.

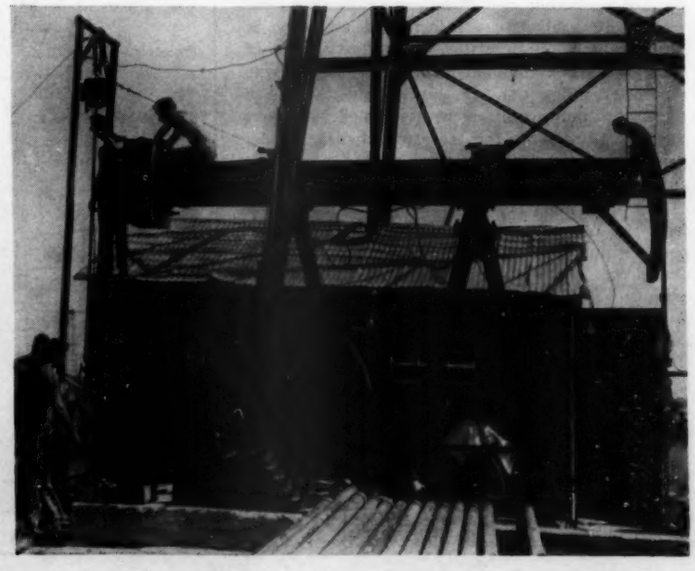
Tested Different Prime Movers

Three types of drives, normal-slip induction motor, high-slip motor, and gas engine were used on the well and were tested for performance. Effect of rotary and beam-type counterbalances was tested on the unit while using each prime mover. The unit was operated on four different strokes, from 24 to 54 in., and on a variety of speeds between 10 and 30 s.p.m. The effect of plunger size and tubing size was obtained by using two different sizes of plungers and two different strings of tubing. Shock tests on the sucker rods were obtained by dropping the 3,500-ft. rod string several inches.

Due to the large number of tests taken, over a third of a mile of oscillograph film was used in recording variables under every operating condition. Each test provided 14 records on film, 8 of which were load measurements.

Isolated tests on wells have been made before, but their results could not be wholly coordinated because of the lack of control of the differences between wells. The object of the above tests was to obtain a complete record of the actual stresses in the pumping mechanism throughout the pumping cycle, and to correlate their occurrences. It has been known for some time, for example, that because the quarter or third of a mile of rods stretch, the plunger at the bottom of the well does not move the same distance on each stroke as the polish rod. At low speeds it does not move as far; at high speeds it moves farther. In fact, for a brief time in each pumping cycle the plunger may be moving downward while the polished rod at the top is moving upward.

The relationship of amplitude and time on a rod string have never been tabulated. The tests may throw light on some unexplained phenomena such as the breaking of a rod string in the middle instead of at the top where the load is supposedly the greatest.



Operation of Electric Centrifugal Producing Pumps in Parallel

By W. H. STUEVE
Oklahoma Gas & Electric Co., Oklahoma City, Okla.

This is the first of several articles by Mr. Stueve on the application and utilization of electric current in the oil industry, a subject which he has studied for a number of years. In forthcoming articles, he will discuss the engineering and economic factors involved on various oil-field projects.

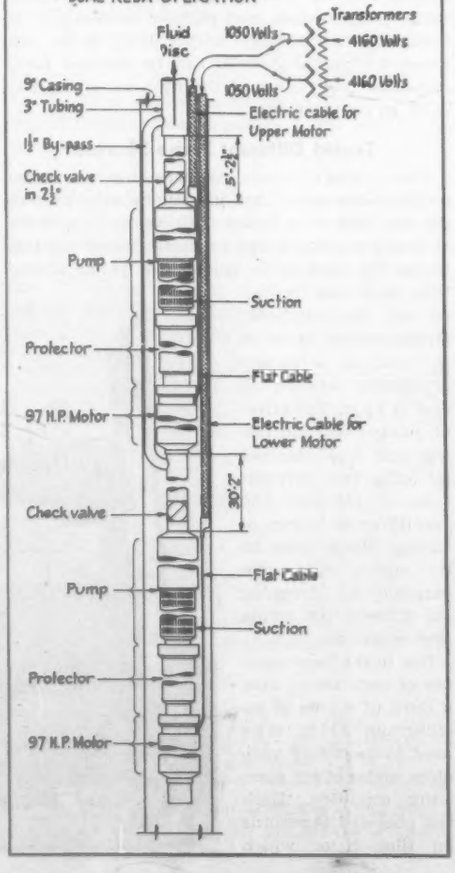
Mr. Stueve has been associated with the Oklahoma Gas & Electric Co. for 16 years having charge of oil-field, pipe-line, and refinery electrification. He is a graduate of Ohio State University, a member of the A.P.I., the A.S.M.E., the A.I.M.E. and the Oklahoma State Board of Registration for Professional Engineers.

THE centrifugal pump actuated with an electric motor in the bottom of oil wells has been adapted to producing such wells for the last 8 or 10 years, and the conventional unit consists of a 97-hp. motor with dimensions of about 5⅛ in. in diameter and 20 ft. long, direct connected through a protector about 5 ft. long to the centrifugal pump containing sufficient impellers to build up sufficient pressure to lift the fluid to the surface of the ground. The motor is usually located below the pump, and the whole unit, perhaps 40 ft. long, is suspended on the tubing and the electric power cable is strapped to the tubing. Variations in design of the unit sometimes locate the pump below the motor to permit the suction inlet to be set in the sump of the well hole in cases where gas bottom pressures are of extremely low values or entirely exhausted. Production results from the conventional bottom centrifugal pump are limited by various factors, such as the inside diameter of the casing, the depth from which the fluid is to be pumped, and of course the cost economies, keeping in mind the fixed horsepower of the motor used. In recent years motors of 135 hp. are being used with correspondingly larger capacity pumps requiring that they be inserted in wells cased with 9-in. pipe. In wells with the fluid standing 4,000 to 5,000 ft. below the surface, the larger pumps equipped with 135-hp. motors can produce 3,000 to 4,000 bbl. per day. This volume still may be too small to permit economic or paying production, but if the volume could be increased from 40 to 50 per cent then sufficient oil could be produced along with the water to make the installation a paying proposition.

Increased Fluid Capacity

An operator in Oklahoma had in stock quite a few 97-hp. units and was operating a well cased with 7-in. pipe which would produce about 2,100 bbl. of fluid from a depth of about 4,500 ft., of which volume 4 per cent was oil, conceived the idea of operating two 97-hp. units in the same well hoping to gain an increased recovery in percentage of oil to water, when the volume of fluid would be doubled. The 7-in. casing was removed leaving the 9-in. casing intact, and the two 97-hp. pump units were assembled as shown in Fig. 1, one on top of the other, all suspended on 3-in. tubing. Each pump contained sufficient stages to exert the pressure required to lift the fluid the entire distance to the surface; in other words, the pumps operated in parallel pumping up through the common discharge of 3-in. tubing. A suitable bypass was arranged of 1½-in. pipe to permit the bottom pump to discharge around the upper pump and motor into the 3-in. tubing, immediately above the upper pump. Suitable check valves were inserted in the discharge of each pump to permit one unit to operate independently of the other should this be necessary. The results obtained from the two units in parallel were satisfactory for the time being, in that the recovery in oil amounted to about 4 per cent of the total fluid pumped, but shortly the recovery fell to 3 per cent and then later slightly lower, until as much oil could be produced with one unit as the two units in parallel would produce, making it economically imperative that the dual unit be removed, and the well is now being pumped with a conventional 97-hp. unit.

FIGURE 1
HOOK-UP OF MOTORS AND PUMPS FOR DUAL REDA OPERATION



Schematic drawing showing hookup of motors and pumps for parallel operation of submerged centrifugal pumps

This producing company had several other wells, from which the 7-in. casing could be removed and which would permit removal of 4,500 to 5,000 bbl. of fluid per day while maintaining a constant fluid level, and accordingly further use of the dual pump unit was made. The first of these several wells selected to make further use of the dual-motor-driven bottom-hole centrifugal pump, was one with a fluid level of 3,900 ft. producing by gas lift 4,400 bbl. of fluid daily (about 9 per cent oil) requiring the injection of 3,000,000 cu. ft. of 500-lb. compressed gas daily.

Due to the gas containing from 5 to 10 per cent air, the corrosion of the tubing and even the casing was causing great difficulties and costing in replacements some months more than the recovered oil. The dual pump unit in this well has been in operation about 4 months, produces 5,500 bbl. of fluid daily (5 per cent oil recovery) with an electric energy input of 7,600 kw.-hr. daily or 27 kw.-hr. per bbl. of oil.

Pumped 5,000 Bbl. per Day

The success of this dual unit in pumping approximately the same amount of oil as the gas lift did for about one-third of the compression costs and without considering the corroded tubing expense, led this operator to construct a second dual pump unit, again using two conventional 97-hp. units similar to the first unit. This second dual unit is now installed in a 9-in. cased well with the 7-in. casing pulled out, and with approximately the same electric energy input as the first dual unit of 7,600 kw.-hr. daily is producing 5,000 bbl. of fluid (5.5 per cent oil recovery) from a depth of 4,000 ft. The single 97-hp. unit originally used in the well which the second dual pump replaced would only produce about one-third of the oil obtained with the dual unit for an electric energy input of one-half that of the dual unit.

The electric power is supplied to the two 150-kva. transformers located at each well at 4160 volts, and the power factor of combined transformer, cable and motor is 88 per cent, with an average secondary voltage of 1,050 volts impressed on the cable at the surface with an average of 100 amp. flowing per phase. The entire combination of electric losses in the field electric supply lines, transformers, cable and motor, coupled with the mechanical losses in the pump and tubing friction, reveal an over-all efficiency of the entire dual unit of 37 per cent from electric metered energy at the section line to fluid delivered in the tank battery. The 150-kva. transformers, two of which are used at each well, are carrying a load of 180 kva. each or a 20 per cent overload, which is not excessive when consideration is given to their location in the open air.

Cost of Producing Oil

By DR. ED BLOESCH
Consulting Geologist, Tulsa, Okla.

The accompanying article is a comment by Dr. Ed Bloesch on some of the facts presented by F. N. Bosco, in his article, "Cost Study of Fort Collins-Wellington, Colorado, Field" in the January 15, 1942, issue of The Oil and Gas Journal. Dr. Bloesch points out that in addition to the costs of exploration mentioned by Mr. Bosco, there are other major items which must be charged against the field.

As he has done work in all of the oil-producing states except Michigan, Dr. Bloesch is well known among petroleum geologists. He holds a doctor's degree from the University of Zurich, Switzerland, and has been a practicing geologist with headquarters in the Mid-Continent area since 1911.

FOREMOST in the mind of all oil producers are two questions: One is well spacing, the other the cost of producing oil, on which depend profit or loss. In The Oil and Gas Journal of January 15, 1942, appeared a paper by Francis N. Bosco, "Cost Study of Fort Collins-Wellington, Colorado, Field," which is of great interest in this connection. The writer states, that, "The cost of producing oil in Colorado has exceeded the net value of reserves plus oil produced." The Fort Collins-Wellington field, the most important so far discovered in Colorado, would have shown a net loss to the producers at a market value of $1 a barrel, but may have netted a slight profit, since some of the oil sold as high as $2.50 a barrel.

Then the author outlines a better development program, consisting essentially of a wider spacing pattern, less casing and unit operation. Even so he concludes that "the price of crude oil must average well above $1 per barrel for such a field to pay out."

The interest of the industrialists is somewhat at variance with the public interest and this is true also in the oil business. The oil producer is looking for good profits. National economy demands the highest possible ultimate recovery. Due to certain shortages the present war economy demands the largest production for the material used. While most producers are willing for patriotic reasons to have their profits reduced, it is imperative to give them sufficient incentive to do the exploratory work, which all posted people know is necessary to keep up our proven reserves.

Wider spacing increases the operating costs per barrel of oil produced. To cite an extreme case: A central power on a 160-acre tract will pump with very little extra expense 36 wells drilled on it in a shallow field, than it would pump only 4 wells on this tract (40-acre spacing). Still the four wells, while probably larger per well than the 36 wells, would only produce a fraction of what the 36 would do. Where wells are operated individually, the difference in lifting cost is not quite so great, but field and office force will have to be almost the same and again the saving in operating cost is in no proportion to the lower barrel production.

Spacing Dependent on Conditions

Unquestionably spacing in some older fields (especially gas) has been too close both from the angle of ultimate recovery and of maximum profits. On the other hand there are many areas where 40-acre spacing of oil wells has the effect that every well is an exploratory well with higher cost and much higher risk. In most fields this is the case with the 640-acre spacing for gas wells. Where the whole field is a continuous reservoir with good permeability, theoretically one gas well or a number of widely spaced oil wells should drain the pool. But the economic limit of producing the well or wells will be reached long before a good total recovery has been obtained. To obtain the benefits of wider spacing the decision ought to be based on all the available engineering data, production history, etc. The field should be operated on the same basis.

For drilling during the present emergency a spacing pattern should be selected for each pool, which would permit the drilling of additional wells after the material shortage has ceased in a way to insure proper ultimate recovery as well as fair profits. It may be said here that, for instance, a single gas well on an isolated dome may not obtain pipe-line connection, thus tying up some of this scarce material. The same is true in a lesser degree of widely spaced oil wells.

On the Wellington dome Mr. Bosco suggests a 160-acre spacing instead of the 40-acre spacing actually used and assumes the same recovery, which he calls highly optimistic, in which we probably all agree.

Investigation and Exploratory Expense

It is evident that such an ideal development program with corresponding savings can never be accomplished, since many facts are unknown ahead of development. This, however, should not detract from the interest in this paper. The cost of exploration as shown was a minimum figure and the present writer would like to call attention to a group of items, the cost of which has been greatly underestimated and which are decidedly a part of the cost of producing oil. This is the expense involved in investigating and exploring a large area, which is usually necessary for the discovery of a producing area.

DR. ED BLOESCH

In Colorado this area may be assumed to cover about 100 times the area of the one producing field. Thus expenses for geological surface work will be about 100 times the $2,100 expended in the Fort Collins-Wellington field or about $200,000. While this amount can be substantially reduced by using reconnaissance methods, subsurface, sample and paleogeographic studies should also be made. Assuming that geophysical work is only undertaken, where surface geology has shown possibilities and where outcrops are insufficient, this may be half of the area under consideration or 50 times the area covered at Fort Collins.

The seismic program outlined for this latter field is the minimum necessary to get any details in most territories. Besides it may be desirable to use in addition other geophysical methods. Thus another $200,000 for geophysics is indicated. It is reasonable to assume that in the whole area studied separate spots would be found where conditions would warrant actual testing, though only 1 out of the 10, in this case the Fort Collins-Wellington field, would furnish a field of real importance.

Leasing Expense

Thus a good many items would be 10 times as high as in the mentioned paper. Leasing expense would be about $10,000, bonuses about $200,000, second-year rental another $200,000 (on some of the acreage probably more than one rental would be paid) and $500,000 would be needed for test wells. Considering the whole enterprise as a unit, the latter sum may be reduced to about $300,000 by using the same material over and in case the test wells would not average more than about 5,000 ft. in depth. The total of these items is about $1,100,000 against $100,000 for the Fort Collins-Wellington field only. This does not take into account the extra overhead involved in this exploration program. It adds about 19 cents to each barrel produced in the Fort Collins-Wellington field.

Even if the main producing field is found early in the course of such an exploration program, the remainder of the area should be worked and tested to prove or disprove its producing possibilities, and if no consequential production is found the cost should be borne by the main field.

The above figures are based on the cost estimates for the Fort Collins-Wellington field by Mr. Bosco. As far as field expenses are concerned, it is recognized that they are on a prewar basis. The same is true for material and operating costs.

The present article was written to emphasize the fact indicated in Mr. Bosco's valuable paper, that prevailing crude prices are absolutely inadequate to operate at a profit under conditions similar to the ones existing in northeastern Colorado.

Conditions in other producing and prospective oil areas are of course different, but wherever only a fair profit was obtained a short time ago, the increased cost of material, labor, transportation and everything else, which ranges from 10 to 100 per cent or even more, has turned many profitable operations into a loss. This is particularly serious in the case of stripper wells, many of which are plugged and abandoned, resulting in an irreparable loss to our national economy.

Refinery IDEAS

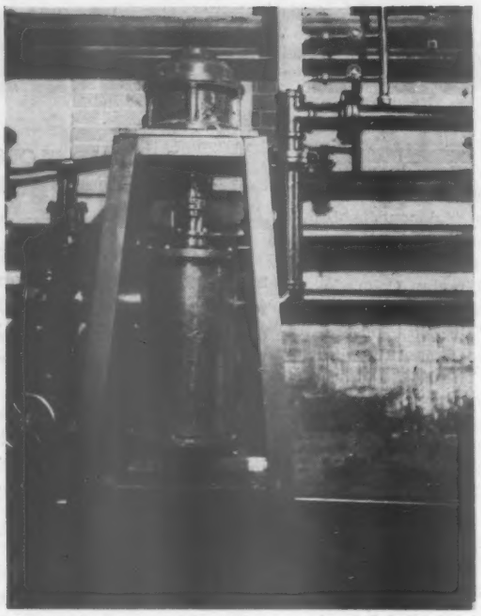
. . . that save $ $ $

Welded Horse For Pipe

The welded horse shown here has a revolving support, consisting of a piece of pipe over a smaller diameter bar which serves as the crosspiece. This horse is particularly suitable for handling pipe which is prevented from rolling off by the "ears" on either side. It can be used for handling pipes and tubes while being inspected or repaired.

Protective Hood Over Blotter Presses

Hoods are suspended over blotter presses to prevent hot oil from squirting out. The hoods are counterweighted so that they may be raised or lowered by hand. They are held in a vertical position when the wax cakes are being removed from the presses.

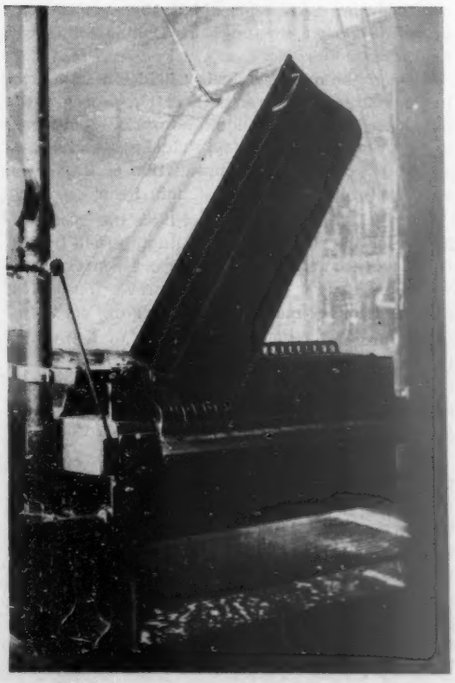


Lube-Oil Mixer

This mixer is used to add paraflow to lubricating oil. Mixing is accomplished in the tank mounted on the base of the frame with an electric motor mounted on the top providing the power for the mixer. The paraflow is kept in a tank under constant pressure and is fed to the mixer through one orifice or a combination of orifices located in the white-painted upright pipe at the right. There are five orifices ranging from 1/32-in. to ¼-in. The feed line to each orifice is controlled by an individual valve. With a constant pressure on the supply tank it is possible to introduce the required amount of paraflow in a specified time.

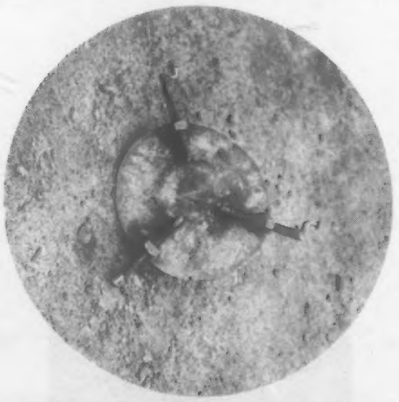
Special Chuck For Cutting Pipe Nipples

This nipple chuck makes it possible to remove the nipple by hand after threading. The wedge forces the backing plate against the nipple when the latter is screwed into the chuck. After threading is completed, the wedge is driven out, releasing the plate, and the nipple is easily removed without the use of a wrench.



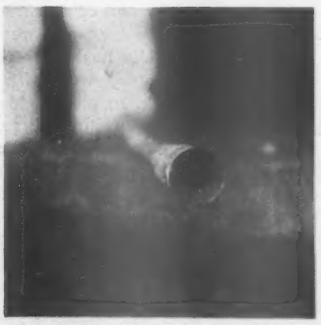
Three-Way Holder For Welding Small Parts

This welding table is equipped with three screws to hold the object being welded in place. Its most unusual feature, however, is that, when in use, it is mounted on a universal joint which permits the welder to adjust it to any desirable position.



Small Tube Cleaner

This picture shows the working end of an efficient, home-made tube cleaner. A piece of 2-in. pipe is flared to the desired diameter. A solid plug is welded in the flared end and holes are drilled through the plug at the angle of the flare. This piece is mounted on the end of a smaller diameter, hollow rod and air or high-pressure steam is ejected through the holes against the wall of the tube.



RESOLUTION
♦ "That this nation, under God, shall have a new birth of freedom; and that government of the people, by the people, and for the people, shall not perish from the earth."
With these historic words, our immortal Abraham Lincoln dedicated America's spiritual and physical strength to the maintenance of democratic ideals and principles. We have pledged our every resource to the fulfillment of this ideal. Spicer Manufacturing Corporation, Toledo, Ohio.
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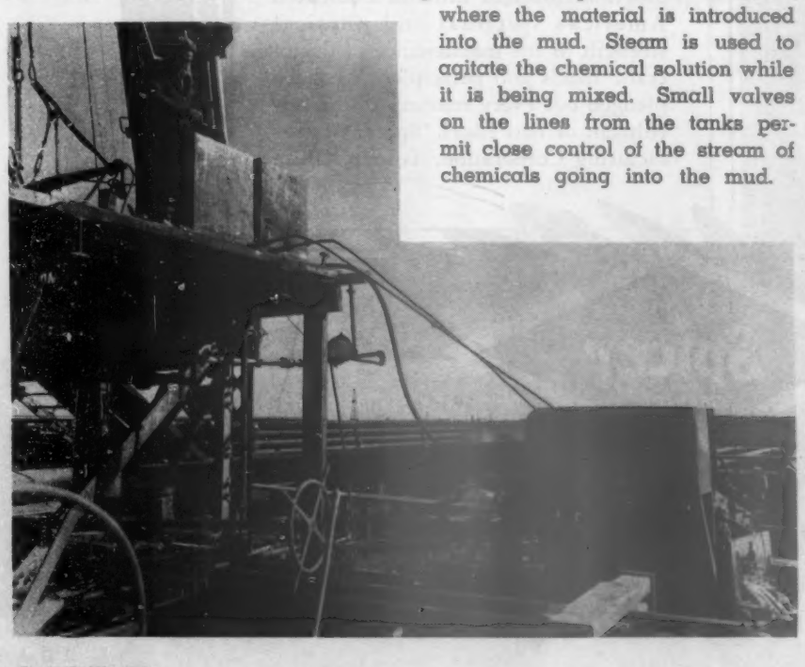
Operating Ideas

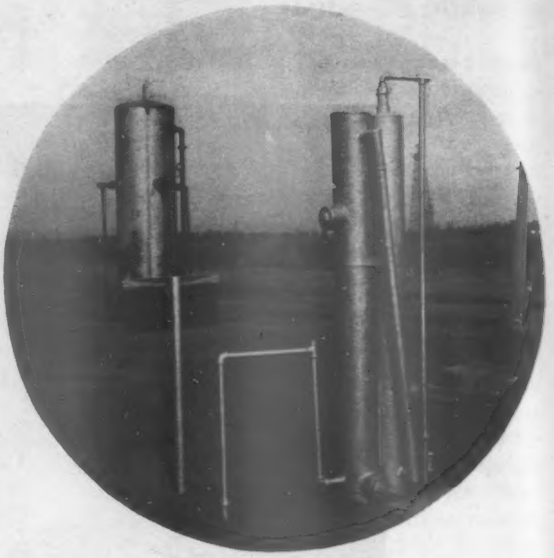
Condenser Coil For Lubricator

Trouble was experienced in obtaining the proper feed from a lubricator on the steam line to a boiler-feed pump on a Texas Gulf Coast rotary rig. Principal cause was believed to be the location of the lubricator below the floor of the boiler auxiliary skid which did not allow enough air circulation to condense the steam in the coil. A special coil was built and attached to the lubricator, but was permitted to stick above the floor. No further trouble was experienced in obtaining satisfactory performance from the lubricator.

Mixing Tanks For Chemicals

Modern mud treatment employs chemical control to obtain the proper water loss and filtrate characteristics of the drilling fluid. Generally, the chemicals are added continuously or over a considerable period depending on the time required to completely circulate the mud. One company operating on the Texas Gulf Coast uses small tanks on the derrick floor in which to mix the chemicals and these have small discharge lines running to the shale shaker where the material is introduced into the mud. Steam is used to agitate the chemical solution while it is being mixed. Small valves on the lines from the tanks permit close control of the stream of chemicals going into the mud.





Volume Tank Removes Moisture

The use of natural gas to drive the internal-combustion engine used to power pumping units generally requires some type of volume chamber to insure satisfactory performance. Usually these are laid in a horizontal position and do not serve as fluid traps. Here is a simple but effective volume chamber used on a well in Pottawatomie County, Oklahoma. Gas enters the left chamber at the bottom and discharges at the top into the bottom of the right chamber, from which it is taken through the regulator and into the engine.

Pipe-Line Pump Driven by Beam

Movement of oil from lease storage into the pipe-line gathering station often requires some type of pump. Sometimes it is not desired to install a pump and prime mover for this purpose and some ingenious methods have been devised. Illustrated is the arrangement used by an operator in the St. Louis, Oklahoma, area. A double-acting single-cylinder pump mounted on the frame of the pumping unit is driven by the walking beam through a toggle rod.

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Abstracts of Papers Presented at Petroleum Section, A.I.M.E.

Pressure Prediction for Oil Reservoirs

By W. A. BRUCE
Carter Oil Co.

THE pressure-prediction methods to be described here are based upon the conception of an oil pool as a small part of a large porous continuum, containing, for the most part, water. The formation containing this water may be thought of as extending over an area of many square miles and having one or more small bodies of oil or gas trapped in high spots or reservoirs. It will be treated as having the general aspect of a thin flat sheet with an over-all tilt to the horizontal and with numerous small high spots, tight zones, and irregularities. This porous continuum will be treated as being much more extensive than the oil or gas zones, but will be recognized as terminating at such large boundaries as a general fault, outcrop, unconformity or pinch out.

Effect of Fluid Expansion

Throughout the greater part of this limited porous continuum it is likely that there is a hydraulic connection. If this is the case, the removal of fluid in one place will cause a disturbance which will eventually travel to all parts of the continuum. This picture has led to the recognition of water as the major fluid in the porous continuum and in many cases the expansive nature of this water as the main driving force producing the oil. The next step is the solution of the general problem of compressible liquid behavior in porous media.

The work published on this subject indicates that the concept of a reservoir of expansible water is a good one, but that the source and magnitude of expensive forces and exact nature of resistance to reservoir fluid flow is open to further investigation. It has been suggested that the effect of the natural expansion of water may be increased by expansion of reservoir rock or by expansion of free gas or release of dissolved gas. Whatever the nature of these effects which appear as constants in the solution to the differential equation expressing the fluid behavior, their effective values can be determined by an inverse solution of the problem in which the actual behavior of the reservoir can be used to evaluate constants in an equation that will predict future behavior. At present a relatively brief part of the history can be used to extend the prediction into the future and to permit the evaluation of possible effects due to changes in production rate or method.

The question might be raised that, if constants have to be determined from field behavior, why not use an entirely empirical equation in which enough constants are placed to account for any behavior? The answer is that by use of the analysis, the factors of geometry and conservation of mass are so combined that the adjustable constants can be reduced to two (permeability and compressibility) and these are held to relatively small variations.

From this point of view it is evident that everything possible should be done to take proper account of the geometrical factors, such as irregular-shaped producing zones, the proximity of a fault or unconformity, the interference of nearby pools, and the size of the porous continuum. It is feasible to account for most geometrical factors, and accordingly, an analytical method was devised to do this.

On the basis of the assumption that the problem is one of a homogeneous compressible liquid contained in an infinite, horizontal, uniformly thick and homogeneous porous medium the following is the general equation relating rate of pro-

$$\Delta = \int_{t_1}^{t_2} \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} \frac{\gamma q\,(x', y', t')}{4\eta K f b}\, e^{-\frac{(x-x')^2 + (y-y')^2}{4K\,(t_2-t')}} \frac{dx'\,dy'\,dt'}{(t_2-t')} \qquad (1)$$

Fig. 1 (below)

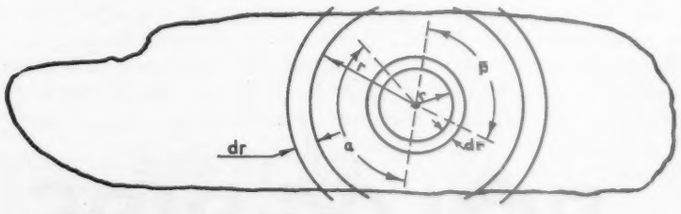
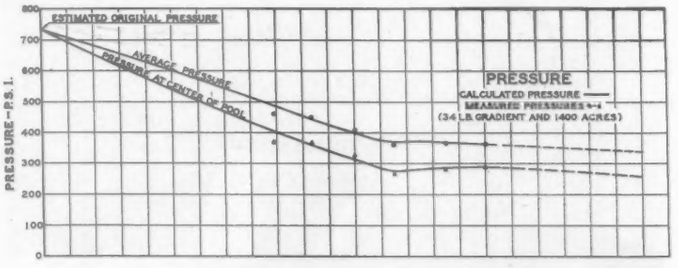


Fig. 2 (right)



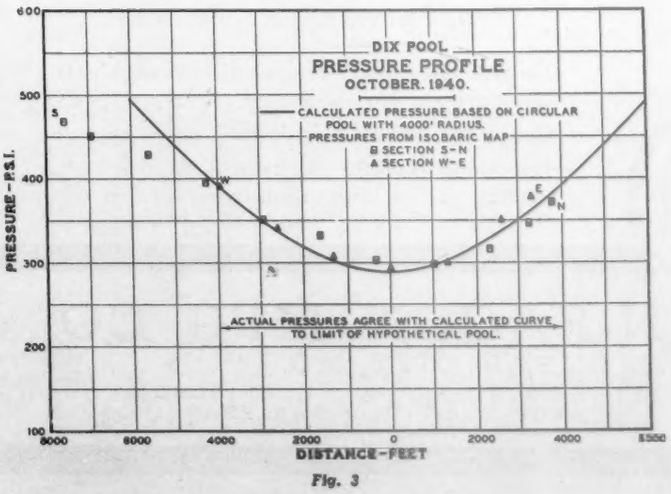
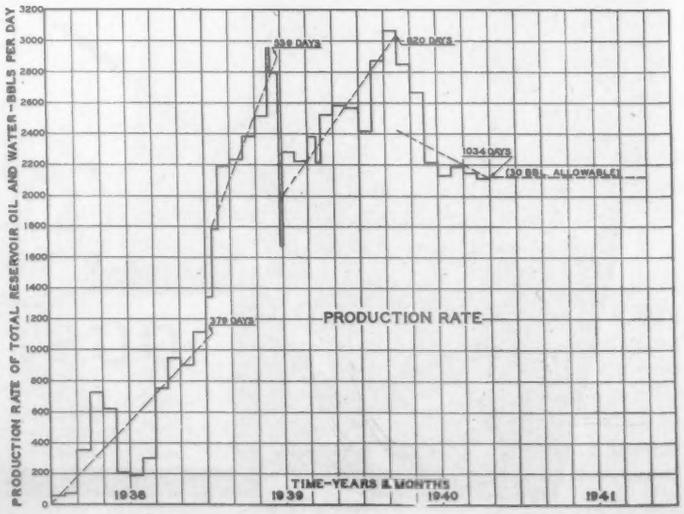


Fig. 3



duction with subsequent reduction in fluid density in which h (r) is the fraction of circular annulus of radius r and thickness dr shown in Fig. 1.

In case the per-acre production rate over the field is uniform or the variation is in a small area or group of wells that can be taken care of by superposition, the formula relating pressure drop due to the uniform per-acre production rate is related to the rate by the formula:

$$\Delta p = \frac{\mu}{2kb} \int_0^R \int_{t'}^{t_2} q\,(t')\; e^{-\frac{r^2}{4K\,(t_2 - t')}} \frac{dt'}{(t_2 - t')}\, rh\,(r)\, dr \qquad (2)$$

Application to an Undersaturated Fluid Reservoir

The problem to which this work is most easily applicable is one in which the oil part of the porous layer is undersaturated. Such a case was found at Dix, Illinois. This field is a small anticlinal structure of about 30-ft. productive closure. It is in a fairly uniform part of the Bethel sand with known boundaries at least 40 miles from Dix. The production has been on an almost uniform per-acre rate and Equation 2 is the one to use. At the time the calculations were made 2½ years of production and pressure history were available from which to fix the constants K and μ/kb.

In the use of Equation 2 it is assumed that the fluid is withdrawn from the reservoir in proportion to the area without any consideration of the mechanism of withdrawal. Actually, the fluid is withdrawn by wells on 20-acre spacing. During flow each well will produce a drop in pressure which is very sharp near the well. These local low-pressure areas near the well are smoothed out when the well is shut in. Pressure studies on shut-in wells where shut-in time is sufficient to account for the local effect would not be dependent upon the number of wells, method of completion, or mechanical equipment provided the same uniform per-acre rate were maintained.

The boundary condition in this problem is assumed to be that of constant pressure at infinite distance from the pool. In this case the assumption is logical because no extensive impermeable barriers are known to be near the pool.

The production history, pressure history, together with pressures at the center of the pool the average pressure contour predicted from Equation 2, are shown in Fig. 2.

The term μ/kb from laboratory work was 0.626, in the equation it was 0.694. The term K from laboratory work was 1.27×10^5, in the equation 1.11×10^5. This would indicate that the mechanism, as pictured, might be close to the actual case.

A crosscheck to this work was found by calculating from Equation 2, with constants determined as described above, the pressure to be expected October 1940 along a line drawn east and west through the center of the field. The calculation, Fig. 3, was then compared with observed pressures along the assumed lines. The agreement here is evidence that proper account of the local geometrical factors is taken by the analysis used.

The problem presented by a field near a fault line is shown by Buckner, Arkansas. This problem is handled by assuming an image field reflected across the fault line. (See Fig. 4.)

The development so far would indicate that two nearby pools could interfere with each other if they have a hydraulic connection. This interference may be expressed as the pressure reduction in one pool as a result of fluid production in an adjacent pool.

An application of these ideas to the pressure behavior in the Magnolia and Village pools (Smackover lime) has been attempted. Fig. 5 shows the geographical relationship between these fields and the theoretical mutual interference.

●

Calculation of Productivity Factors for Oil-Gas-Water Systems in the Steady State

By H. H. EVINGER and M. MUSKAT
Gulf Research & Development Co., Pittsburgh, Pa.

A METHOD of calculating productivity factors for oil, gas, and water systems in the steady state is presented as an illustration of the quantitative application of the fundamental data on the flow properties of heterogeneous fluid systems. While the numerical results of the calculations cannot be applied directly to field conditions, because they are based on permeability data for unconsolidated sands and involve specific assumptions regarding the nature of the reservoir fluids, the methods of analysis and interpretation should have significance in considering certain specific field situations when the necessary field and laboratory data become available. Moreover, it is felt that even under the idealized conditions to which the numerical calculations refer they should serve to give at least the orders of magnitude of the effects of gas-oil ratio and connate water on observed productivity factors. Within the indicated limitations, the computations imply that the foregoing factors can explain only a part of the apparent discrepancy between the homogeneous fluid productivity factors and those obtained recently in field measurements on the West Coast.

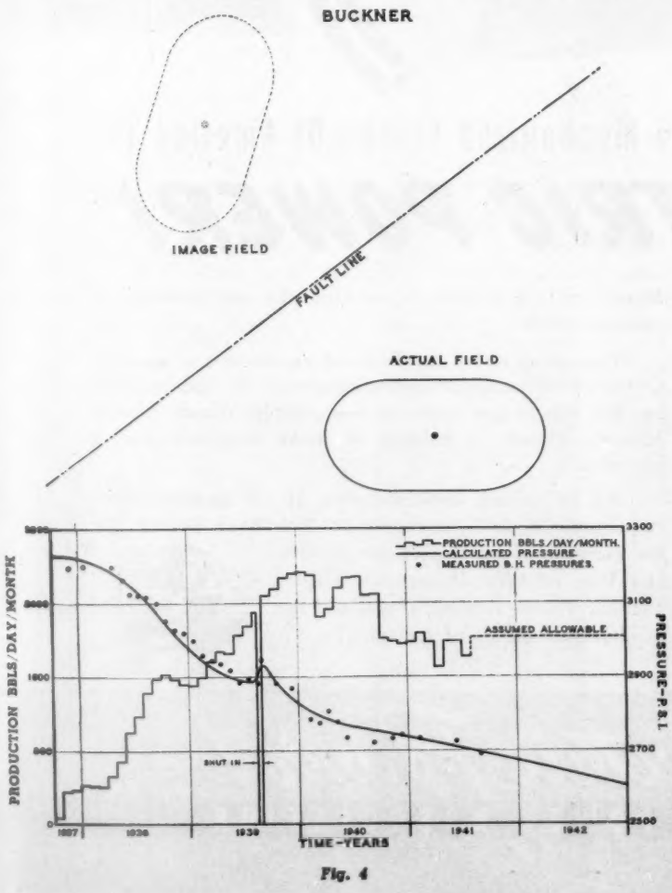


Fig. 4

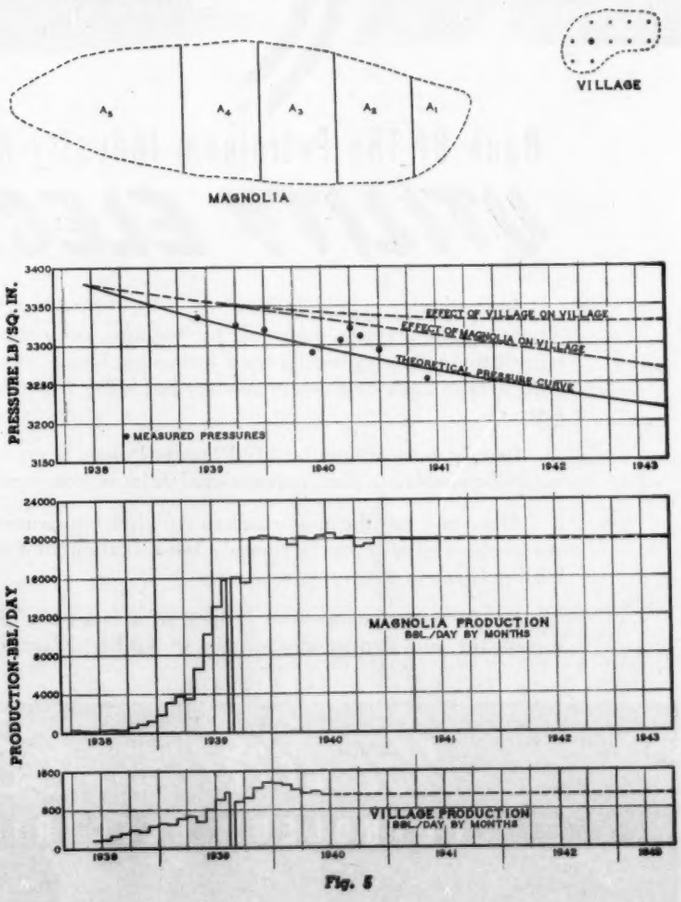


Fig. 5

Abstracts of Papers Presented at Petroleum Section, A.I.M.E.

Pressure Prediction for Oil Reservoirs

By W. A. BRUCE
Carter Oil Co.

THE pressure-prediction methods to be described here are based upon the conception of an oil pool as a small part of a large porous continuum, containing, for the most part, water. The formation containing this water may be thought of as extending over an area of many square miles and having one or more small bodies of oil or gas trapped in high spots or reservoirs. It will be treated as having the general aspect of a thin flat sheet with an over-all tilt to the horizontal and with numerous small high spots, tight zones, and irregularities. This porous continuum will be treated as being much more extensive than the oil or gas zones, but will be recognized as terminating at such large boundaries as a general fault, outcrop, unconformity or pinch out.

Effect of Fluid Expansion

Throughout the greater part of this limited porous continuum it is likely that there is a hydraulic connection. If this is the case, the removal of fluid in one place will cause a disturbance which will eventually travel to all parts of the continuum. This picture has led to the recognition of water as the major fluid in the porous continuum and in many cases the expansive nature of this water as the main driving force producing the oil. The next step is the solution of the general problem of compressible liquid behavior in porous media.

The work published on this subject indicates that the concept of a reservoir of expansible water is a good one, but that the source and magnitude of expensive forces and exact nature of resistance to reservoir fluid flow is open to further investigation. It has been suggested that the effect of the natural expansion of water may be increased by expansion of reservoir rock or by expansion of free gas or release of dissolved gas. Whatever the nature of these effects which appear as constants in the solution to the differential equation expressing the fluid behavior, their effective values can be determined by an inverse solution of the problem in which the actual behavior of the reservoir can be used to evaluate constants in an equation that will predict future behavior. At present a relatively brief part of the history can be used to extend the prediction into the future and to permit the evaluation of possible effects due to changes in production rate or method.

The question might be raised that, if constants have to be determined from field behavior, why not use an entirely empirical equation in which enough constants are placed to account for any behavior? The answer is that by use of the analysis, the factors of geometry and conservation of mass are so combined that the adjustable constants can be reduced to two (permeability and compressibility) and these are held to relatively small variations.

From this point of view it is evident that everything possible should be done to take proper account of the geometrical factors, such as irregular-shaped producing zones, the proximity of a fault or unconformity, the interference of nearby pools, and the size of the porous continuum. It is feasible to account for most geometrical factors, and accordingly, an analytical method was devised to do this.

On the basis of the assumption that the problem is one of a homogeneous compressible liquid contained in an infinite, horizontal, uniformly thick and homogeneous porous medium the following is the general equation relating rate of pro-

$$\Delta = \int_{t_1}^{t_2} \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} \frac{\gamma q\,(x', y', t')}{4\eta K f b}\, e^{-\frac{(x-x')^2 + (y-y')^2}{4K\,(t_2-t')}} \frac{dx'\,dy'\,dt'}{(t_2-t')} \qquad (1)$$

Fig. 1 (below)

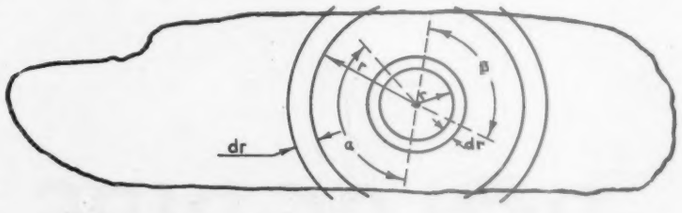
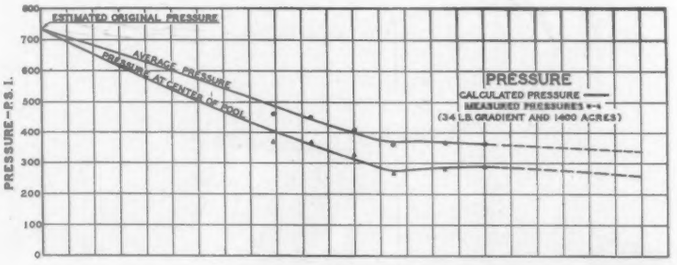


Fig. 2 (right)



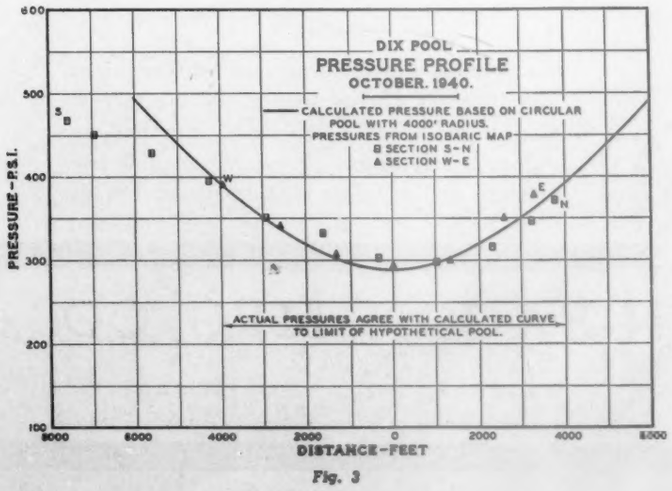
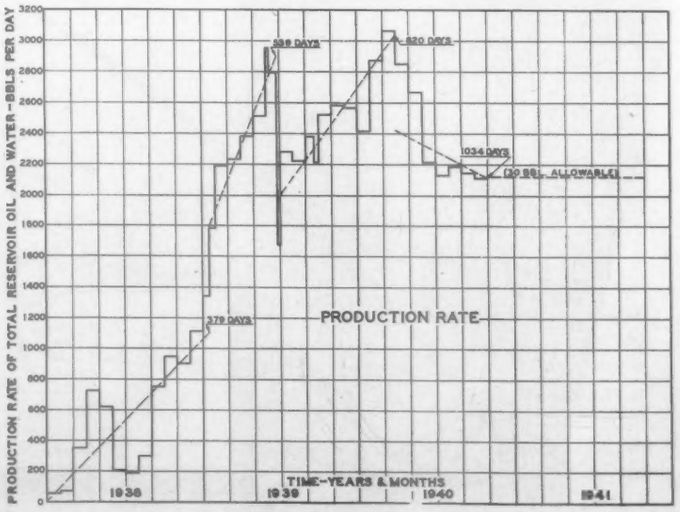


Fig. 3



duction with subsequent reduction in fluid density in which $h\ (r)$ is the fraction of circular annulus of radius r and thickness dr shown in Fig. 1.

In case the per-acre production rate over the field is uniform or the variation is in a small area or group of wells that can be taken care of by superposition, the formula relating pressure drop due to the uniform per-acre production rate is related to the rate by the formula:

$$\Delta p = \frac{\mu}{2kb} \int_{o}^{R} \int_{t'}^{t_2} q\,(t')\; e^{-\frac{r^2}{4K\,(t_2 - t')}} \frac{dt'}{(t_2 - t')}\, rh\,(r)\, dr \qquad (2)$$

Application to an Undersaturated Fluid Reservoir

The problem to which this work is most easily applicable is one in which the oil part of the porous layer is undersaturated. Such a case was found at Dix, Illinois. This field is a small anticlinal structure of about 30-ft. productive closure. It is in a fairly uniform part of the Bethel sand with known boundaries at least 40 miles from Dix. The production has been on an almost uniform per-acre rate and Equation 2 is the one to use. At the time the calculations were made 2½ years of production and pressure history were available from which to fix the constants K and μ/kb.

In the use of Equation 2 it is assumed that the fluid is withdrawn from the reservoir in proportion to the area without any consideration of the mechanism of withdrawal. Actually, the fluid is withdrawn by wells on 20-acre spacing. During flow each well will produce a drop in pressure which is very sharp near the well. These local low-pressure areas near the well are smoothed out when the well is shut in. Pressure studies on shut-in wells where shut-in time is sufficient to account for the local effect would not be dependent upon the number of wells, method of completion, or mechanical equipment provided the same uniform per-acre rate were maintained.

The boundary condition in this problem is assumed to be that of constant pressure at infinite distance from the pool. In this case the assumption is logical because no extensive impermeable barriers are known to be near the pool.

The production history, pressure history, together with pressures at the center of the pool the average pressure contour predicted from Equation 2, are shown in Fig. 2.

The term μ/kb from laboratory work was 0.626, in the equation it was 0.694. The term K from laboratory work was 1.27×10^5, in the equation 1.11×10^5. This would indicate that the mechanism, as pictured, might be close to the actual case.

A crosscheck to this work was found by calculating from Equation 2, with constants determined as described above, the pressure to be expected October 1940 along a line drawn east and west through the center of the field. The calculation, Fig. 3, was then compared with observed pressures along the assumed lines. The agreement here is evidence that proper account of the local geometrical factors is taken by the analysis used.

The problem presented by a field near a fault line is shown by Buckner, Arkansas. This problem is handled by assuming an image field reflected across the fault line. (See Fig. 4.)

The development so far would indicate that two nearby pools could interfere with each other if they have a hydraulic connection. This interference may be expressed as the pressure reduction in one pool as a result of fluid production in an adjacent pool.

An application of these ideas to the pressure behavior in the Magnolia and Village pools (Smackover lime) has been attempted. Fig. 5 shows the geographical relationship between these fields and the theoretical mutual interference.

●

Calculation of Productivity Factors for Oil-Gas-Water Systems in the Steady State

By H. H. EVINGER and M. MUSKAT
Gulf Research & Development Co., Pittsburgh, Pa.

A METHOD of calculating productivity factors for oil, gas, and water systems in the steady state is presented as an illustration of the quantitative application of the fundamental data on the flow properties of heterogeneous fluid systems. While the numerical results of the calculations cannot be applied directly to field conditions, because they are based on permeability data for unconsolidated sands and involve specific assumptions regarding the nature of the reservoir fluids, the methods of analysis and interpretation should have significance in considering certain specific field situations when the necessary field and laboratory data become available. Moreover, it is felt that even under the idealized conditions to which the numerical calculations refer they should serve to give at least the orders of magnitude of the effects of gas-oil ratio and connate water on observed productivity factors. Within the indicated limitations, the computations imply that the foregoing factors can explain only a part of the apparent discrepancy between the homogeneous fluid productivity factors and those obtained recently in field measurements on the West Coast.

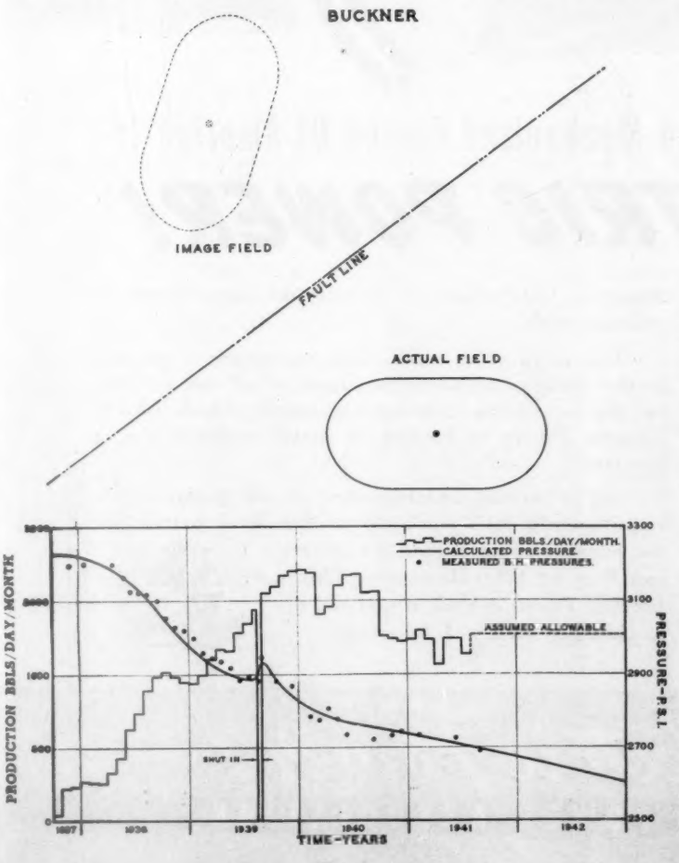


Fig. 4

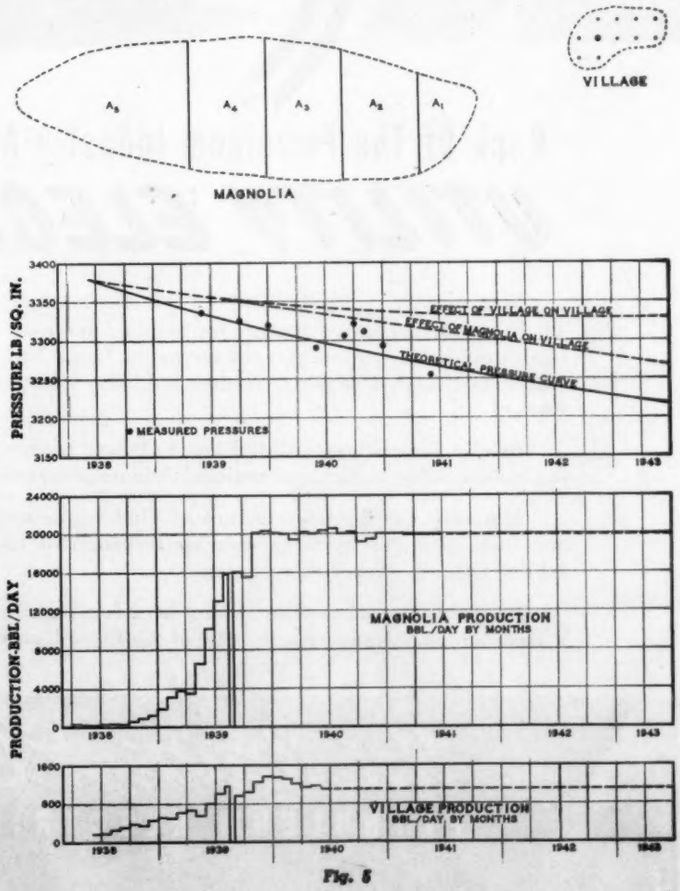


Fig. 5

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Engineering Economics of Long Pipe Lines

By EDGAR G. HILL
Vice President of Ford, Bacon & Davis, Inc., New York

THE laws governing the flow of crude oil through pipes are well known. The basic flow formula can be simply expressed as follows:

$$Q = \sqrt{\frac{PD^5}{KG}}$$

Where
Q = delivery per 24 hours, barrels (42 gal.)
P = pressure loss per square inch per mile, pounds
D = inside diameter of pipe, inches
K = a factor depending on the volume and characteristics of the fluid handled and the diameter of the pipe
G = the specific gravity of the fluid handled, water being taken as 1 at 60° F.

Factor K is determined from a knowledge of the velocity of the oil in the line, the viscosity of the oil, and the density of the oil. In ordinary practice, for oils of moderate viscosity, factor K usually ranges from 0.0024 to 0.0018 for a 6-in. line to 0.0013 to 0.0015 for a 24-in. line.

The usual pressure at the initial point is 800 to 1,000 lb. per sq. in., 900 lb. being a fair average. Pumping stations are spaced along the lines at intervals of 25 to 75 miles.

Pressure drop per mile ranges from as much as 30 lb. to as little as 10 lb. For the computation shown on the charts, Figs. 1 and 2, a pressure drop of 15 lb. per sq. in. per mile has been adopted, not because it is always the most economical but simply because it is satisfactory for comparative purposes.

Applications of Basic Flow Formula

The determination of the most economical pressure drop per mile in a long pipe line requires analysis in each individual case. It depends to some extent on the probable increase in capacity that may be needed later.

Assume that a long pipe line is to be built to handle 17,250 bbl. of 35° B. crude oil per 24 hours, and that this oil has a Saybolt viscosity at 60° F. of 150 seconds, which is a good fluid crude. Experience indicates that an 8-in. line probably will be needed for these conditions, and the problem becomes that of determining the pressure drop per mile in an 8-in. line, which fixes the spacing of the pumping stations. If the trial analysis obviously gives too low a pressure drop per mile, computations will be made for a 6-in. line, the next smaller commercial pipe size.

From our tables and charts, the factor K for these conditions of volume, 8-in. pipe size and viscosity is determined as 0.00213 and the formula is set up as follows (35° B. crude having a specific gravity of 0.85):

$$P = \frac{0.00213 \times 17{,}250^2 \times 0.85}{8.071^5}$$

P = 15.7 lb. per mile; say 16 lb. for convenience

In flat country, if the discharge pressure at stations is to be 900 lb. and the intake at the next station down the line 100 lb., the stations will be spaced.

$$\frac{900 - 100}{16} = 50 \text{ miles apart}$$

Where lines are built in mountainous or rough country, an accurate profile of the pipe line is essential because the difference in elevation of the successive stations must be taken into account as well as the friction loss in determining the station spacing.

Horsepower Required for Pumping

The power required in each station is computed as follows:

$$\text{Hp.} = \frac{\text{Gallons per minute pumped} \times \text{net pressure in pounds per square inch} \times 2.31}{3.960 \times E}$$

E is the efficiency of the pumps employed.

Pumping-station horsepower therefore is computed as follows:

$$\frac{17{,}250 \times 42}{1{,}440} = 503 \text{ g.p.m.}$$

Pumps having an efficiency of 75 per cent will be used, therefore

$$\text{Hp.} = \frac{503 \times 800 \times 2.31}{2{,}970} = 313$$

to which will be added 10 to 20 per cent as a safety factor and 350 to 375 hp. of drivers will be used in each pumping station, depending on the type used, whether electric or diesel.

Comparative Costs of Lines

With pipe costing $80 per ton, including freight, and average construction conditions, the cost of this line per 100 miles would approximate $1,262,000, including the two pumping stations and other appurtenant facilities. This is equivalent to $12,620 per mile, or 73 cents per mile per barrel of daily capacity.

We will now refigure the design of this line based on the use of 6-in. pipe operating at the same 900-lb. pressure, to determine comparative over-all cost.

A.I.M.E. ABSTRACT

The factor K for a 6-in. line handling 17,250 bbl. of the same crude per day is 0.00196 and the formula is set up:

$$P = \frac{0.00196 \times 17{,}250^2 \times 0.85}{6.065^5}$$

P = 60 lb.

The station spacing is thus:

$$\frac{900 - 100}{60} = 13.3 \text{ miles}$$

requiring 7½ pumping stations in 100 miles, or 15 in 200 miles.

The cost of the project for 200 miles of line, then, is:

200 miles of pipe line at $7,500	$1,500,000
15 pumping stations, 350 hp. each	1,260,000
Other facilities	220,000
Total per 200 miles	$2,980,000
Average per mile	14,900

A 6-in. line, therefore, is too small to handle economically 17,250 bbl. per day. A 10-in. line would handle this volume easily with only one pumping station in 160 miles but the first cost of a 10-in. line with fewer stations would be much higher than the cost of an 8-in. line.

Capacities of Lines and Cost per Mile

Fig. 2 shows the computed daily capacities, in barrels, of long pipe lines of various diameters, when handling 35° B. crude oil of moderate viscosity (150 S.U.S. at 60° F.) and when handling 58° B. gravity gasoline, the computed line capacities being based on station discharge pressures of 900 lb. and a pressure drop of 15 lb. per mile.

Fig. 2 shows the estimated approximate total investment cost per mile, including pumping stations, of crude-oil and gasoline lines from 6-in. to 24-in. diameter, inclusive; also, the cost per mile per barrel of daily capacity of such lines.

Effect of Viscosity on Over-all Transportation Costs

A few crudes are so viscous that they must be heated before they can be pumped; and others

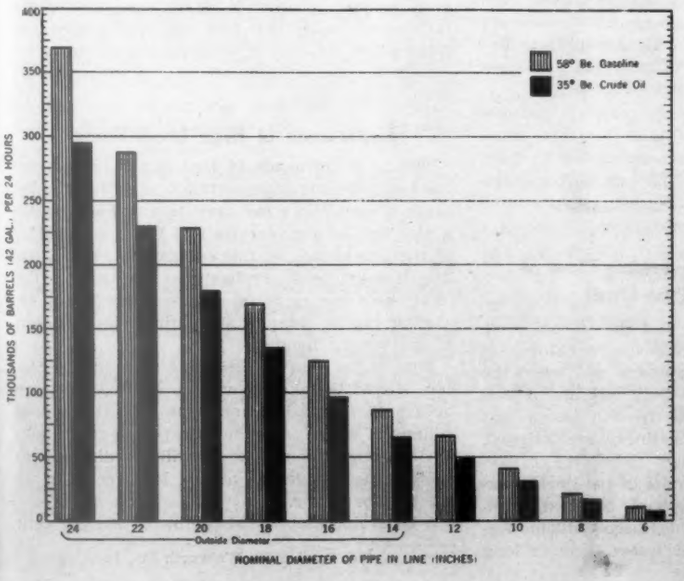

Fig. 1 (left)

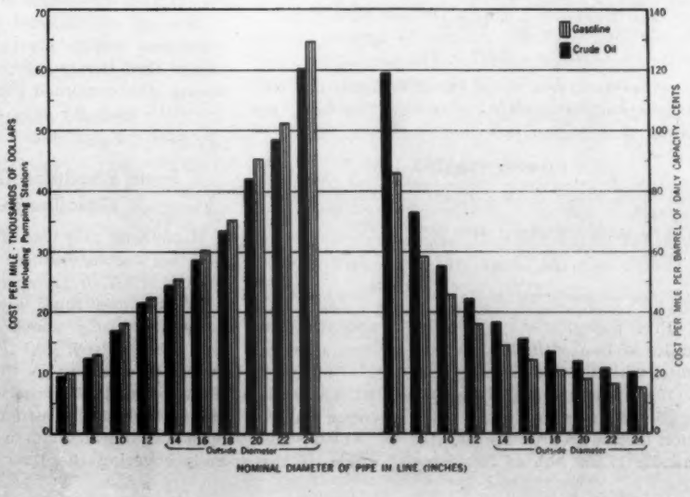

Fig. 2 (below)

that are fluid at summer temperatures become rapidly more viscous as the temperature lowers. When such oils are pumped in cold climates they must be heated or the delivery capacity of the line is sharply reduced.

In determining factor K in the basic pipe-line formula, the kinematic viscosity (i.e., the ratio of the absolute viscosity to the density of the crude oil to be pumped) is required. This is determined by the use of the Saybolt Universal viscosimeter. The figure so determined is used in the expression

$$\frac{Q}{DY}$$

Where:

Q = barrels transported for 24 hours
D = internal diameter of pipe in inches
Y = kinematic viscosity of oil in centipoises divided by density in grams per cubic centimeter

After Q/DY is determined the factor K may be determined by the use of a chart, Fig. 4, which shows the relationship between Q/DY and K for any value of Q/DY.

To show the effect of viscosity on the pressure drop in pounds per square inch per mile of pipe line, we will determine the station spacing and total horsepower required per 100 miles of line for two crudes of different viscosities but of the same specific gravity, using the 8-in. line handling 17,250 bbl. per day.

For crude A.

$$Q = 17{,}250$$

$$D = 8.071$$

Viscosity = 150 Saybolt Universal seconds at 60° F.

A curve has been developed showing the relation between the S.U.S. viscosity and the kinematic velocity Y. From this curve, using S.U.S. at 150:

$$Y = 31.5$$

$$\frac{Q}{DY} = \frac{17{,}250}{8.071 \times 31.5} = 68$$

Where:

$$\frac{Q}{DY} = 68$$

$$K = 0.00213$$

and by substituting the value of K so determined in the basic formula

$$P = \frac{KQ^2G}{D^5}$$

P = 15.7 or, say, 16 lb. per mile

Thus, a 350-hp. station will be needed every 50 miles to handle this oil through an 8-in. line, two stations on a 100-mile line and four on a 200-mile line.

Crude B, however, is more viscous, with a Saybolt viscosity of 300 at 60° F. Y then becomes 65 and

$$\frac{Q}{DY} = \frac{17{,}250}{8.071 \times 65} = 32.9$$

From a curve a value for K is found of 0.0027 corresponding to 32.9 for Q/DY. The basic formula then becomes:

$$P = \frac{0.0027 \times 17{,}250^2 \times 0.85}{8.071^5} = 20$$

The station spacing then is

$$\frac{900 - 100}{20} = 40 \text{ miles}$$

Five pumping stations will be needed in 200 miles of line with the 300-viscosity crude against four with the 150-viscosity crude.

If the line had already been built with a 50-mile station spacing, we would try to increase the station discharge pressure to 1,100 lb., which would handle 17,250 bbl. of 300-viscosity crude. If that could not be done, the pressure could be held at 900 lb. and the pumps slowed down to deliver

$\sqrt{16/20}$ or 89.5 per cent of 17,250 bbl.,
or 15,440 bbl. daily,

The transportation cost per barrel is increased by the higher viscosity of the oil.

The lowered temperature in winter necessitates increased station pressures for normal deliveries.

Basic Costs of Transporting Crude Oil

Published data show that for the larger system the gross revenue, or barrelage handled times the tariff, averaged almost exactly 6 cents per barrel per 100 miles in the year 1937, which is equivalent to 4 mills per ton-mile.

There have been recent reductions in pipe-line tariffs, and it is probable that at the present time 5 cents per barrel per 100 miles, or 3⅓ mills per ton-mile, is a more accurate figure.

Effect of Costs of Increased Line Size

If the capacity to be handled by a pipe line can be increased to 200,000 or 250,000 bbl. daily, line diameters of 20 to 24 in. become possible.

It is easy to show that the cost per barrel-mile for transporting oil from Texas to the Philadelphia or New York areas by such a system would be much lower than anything yet attained in pipe-line operation.

To be specific, the cost of a 12-in. line with a capacity of 50,000 bbl. of crude per day is estimated at $21,900 per mile at today's price levels, equivalent to 43.8 cents per mile per barrel of daily capacity.

A 24-in. line with a daily capacity of 295,000 bbl. of the same crude is estimated to cost $60,200 per mile, equivalent to only 20.4 cents per mile per barrel of daily capacity. The capital costs of transporting oil through the 24-in. line therefore are only 46.6 per cent as much per barrel of capacity as for a 12-in. line.

The routine operating expenses in dollars, with the exception of pumping cost for the 24-in. line, might possibly be as much as 150 per cent of those of the 12-in., but on a per-barrel daily capacity basis would then only be about one-fourth as much, and the same should hold true of administration costs.

It is obvious that the over-all operating costs per barrel-mile for a 24-in. line would be about half those of a 12-in. line—or, say, 2½ cents per barrel per 100 miles—from which it can be readily deduced that as against the present tariff of 67 cents per barrel charged by the pipe-line carriers from the East Texas field to the New York area, a distance of about 1,400 miles, the corresponding tariff on the proposed 24-in. line would probably not have exceeded 35 cents per barrel at a reasonably good load factor.

Most of the oil used by the eastern seaboard refineries travels via pipe line from the fields to the Gulf Coast and thence by tanker to destination, the combined pipe-line and tanker transportation cost for this movement being around 35 cents per barrel in normal times.

Basic Principles Governing Flow of Gasoline in Pipe Lines

It happens that viscosities of the refined products are not determined in the same manner as for crude oil and it also happens that when the early gasoline lines were built not much was known precisely about the friction losses that would be realized, so that the lines were designed, generally speaking, as though they were to handle water and when the results of the lines' operations were determined the basic constant developed was the factor C in the Hazen-Williams formula covering the flow of water through long pipes. The constant C has been often taken at 130 for the average gasoline.

The Hazen-Williams formula for the flow of water is:

$$v = C \times r^{0.63} \times s^{0.54} \times 0.001^{-0.04}$$

Where:

v = velocity per second, feet
c = a constant for a given pipe, the numerical value of which is affected by the roughness of the wetted inside of the pipe
r = the mean hydraulic radius (diameter ÷ 4)
s = the slope of the pipe (pressure drop in feet of fluid ÷ length)

Using the foregoing formula as a basis and substituting the value of 130 for C, introducing the specific gravity of gasoline and expressing the rate of flow in barrels per hour, the Walworth Co., Inc., suggests the following modification* of the basic formula:

$$p^{0.54} = Q \times g^{0.54} \times F$$

In which:

p = pressure drop due to friction, pounds per square inch per mile
Q = barrels of gasoline flowing per hour
g = specific gravity of flowing gasoline referred to water as 1.0
F = a factor that is a function of the inside diameter of the pipe (d, in inches) with which the formula constant is combined. Its value is $1.25/d^{2.63}$

For convenience in the use of the formula, values of F for nominal sizes of A.P.I. line pipe are tabulated in Table 1.

TABLE 1—NUMERICAL VALUES OF FACTOR F

Nominal pipe size A.P.I. line pipe, inches—	Numerical value of factor F
1	1,102.3 × 10^{-13}
1¼	535.79 × 10^{-13}
1½	357.24 × 10^{-13}
2	185.18 × 10^{-13}
2½	116.06 × 10^{-13}
3	65.548 × 10^{-13}
3½	44.723 × 10^{-13}
4	32.068 × 10^{-13}
5	17.698 × 10^{-13}
6	10.917 × 10^{-13}
8	5.3033 × 10^{-13}
10	2.9151 × 10^{-13}
12	1.8142 × 10^{-13}
14 o.d.	1.3979 × 10^{-13}
15 o.d.	1.1542 × 10^{-13}
16 o.d.	966.0 × 10^{-14}
17 o.d.	822.3 × 10^{-14}
18 o.d.	706.2 × 10^{-14}
20 o.d.	528.5 × 10^{-14}

This Walworth conversion of the basic Hazen-Williams formula presents a very convenient basis for computing the flow of gasoline through pipe lines, using a median figure of 130 for the friction constant.

In considering the economics of crude-oil and gasoline pipe lines, it cannot be too strongly emphasized that they must be kept internally clean to be operated efficiently.

It is basically necessary, therefore, to handle large volumes in order to obtain the lowest costs. It is undoubtedly this fact that has caused the cooperation between otherwise competitive interests in the construction of refined-products pipe lines.

Importance of High Load Factor

The great influence of load factor on over-all costs of pipe-line transportation is primarily because it costs about the same to own and operate a pipe line of a given size and length regardless of the percentage of full capacity at which the line is being used. Probably 80 per cent of the total operating costs of a pipe-line system, including capital charges, are entirely independent of the volume handled.

This means that in designing pipe lines great care should be taken to make sure that they are built not so large in comparison with the annual volume of crude or products expected to be handled through them that it will be difficult to operate them under an annual load factor of 75 per cent or better.

A large line that would operate at 100 per cent

*See p. 499, Catalog 89, Walworth Co., Inc.

load factor with a cost of say 3 cents per barrel per 100 miles would probably show a cost of about 3.25 cents at 90 per cent load factor, 3.63 cents at 75 per cent and 5.4 cents at 50 per cent, so that good load factor is fully as important as large volume in reducing costs of pipe-line transportation.

Determination of Well Capacities From Liquid-Level Data

By CHARLES RODD
Gulf Oil Corp.

A.I.M.E. ABSTRACT

IN the latter part of 1938 the Kansas Corporation Commission gave official sanction to the use of both Depthograph and Echometer equipment for testing certain types of wells. The use of bottom-hole-pressure gages was also approved and, later, a method of determining bottom-hole pressures from liquid levels and other data was included. This latter method has become commonly known as the "back-pressure method." Both the Depthograph and Echometer equipment are operated by service companies. The Depthograph uses a wave front set up by a charge of compressed air, a diaphragm for picking up wave reflections and a timing and recording apparatus. Echometer equipment utilizes a cartridge for setting up a wave front, a Tucker hot-wire microphone for detecting wave reflections, and an electrically controlled, direct-recording apparatus for obtaining a record of the wave reflections from tubing collars and liquid levels.

A third instrument, called the Sonic Meter, for determining depths to liquid level in wells, was developed by Gulf Oil Corp. This instrument is electrically controlled; an ordinary blasting cap is used to initiate a wave front, a carbon-Lutton microphone picks up reflections from tubing collars and liquid level and an oscillograph transmits them to a camera recording device.

The development of liquid-level measuring equipment has given the oil industry a readily available means of measuring the liquid drawdown of a producing oil well.

Theoretical and Physical Factors in Well Testing

Potentials, or well capacities, determined from bottom-hole-pressure or liquid-level measurements are based on a straight-line relationship between pressure at the bottom of the well and the rate of production. Under certain conditions, liquid level is proportional to pressure and the height of the liquid column may be substituted therefor. Tests taken in this manner have commonly been referred to as drawdown tests.

When the drawdown of pressure or liquid level is directly proportional to liquid production, the pressure-flow relationship may be expressed by a constant which is commonly called the productivity index, which may be expressed in barrels per day per pound reduction in bottom-hole pressure or barrels per day per foot drawdown.

Numerous wells, with liquid capacities ranging up to 2,000 bbl. per day have been tested to near capacity without deviating from the straight-line relationship, and tests have been made on larger wells, producing as much as 2,800 bbl. per day, without deviation. Where a straight-line relationship between pressure and producing rate exists, the relationship may be expressed algebraically as follows:

$$C = \frac{Q}{P_r - P_p} \qquad (1)$$

where:

C = productivity-index factor, barrels per day per pound pressure drop
P_r = static-reservoir pressure, pounds per square inch
P_p = equilibrium bottom-hole pressure, pounds per square inch at stable rate Q
Q = production rate, barrels per 24 hours

Then:

$$Q_{max} = C\,P_r \qquad (2)$$

where:

Q_{max} = total well capacity, barrels per 24 hours.

Also:

$$C = \frac{Q_2 - Q_1}{P_1 - P_2} \qquad (3)$$

where:

Q_1 = production rate, barrels per 24 hours, at Pressure P_1
Q_2 = production rate, barrels per 24 hours, at Pressure P_2

From this equation the well capacity may be expressed as:

$$Q_{max} = CP_1 + Q_1 = CP_2 + Q_2, \text{ etc.} \qquad (4)$$

From the above it can be seen that the factors needed for determining a well's capacity are the stable pressures at two producing rates, or static pressure and stable pressure at one rate. For accuracy in testing, the former is preferred.

Bottom-hole pressures can be determined by the use of bottom-hole-pressure gages, or may be determined from surface data and liquid-level measurements. The components of bottom-hole pressure are (1) the pressure due to the weight of the liquid column in the annulus, (2) the pressure due to the weight of gas in the annulus and (3) the pressure at the well head. Stated algebraically:

$$P_{bh} = hd + P_g + P_{ch} \qquad (5)$$

where:

P_{bh} = bottom-hole pressure, pounds per square inch
h = height of the liquid column, in feet
d = mean column weight of liquid, per foot per square inch
P_g = pressure due to weight of gas column, pounds per square inch
P_{ch} = pressure at well head, pounds per square inch

Tests From Liquid Levels Only

In certain types of wells, notably Arbuckle dolomite wells in Kansas, Factors 2 and 3, Equation 5, may be neglected and bottom-hole pressure becomes proportional to the height of the liquid column. Then:

$$C_1 = \frac{Q_1}{d_1 - d} \qquad (6)$$

where:

C_1 = productivity-index factor, barrels per day per foot drawdown
Q_1 = production rate, barrels per day
d = distance in feet to static liquid level
d_1 = distance in feet to liquid level at production rate Q_1

Then:

$$Q_{max} = C_1\,(L - d) \qquad (7)$$

where:

L = depth in feet from well head to top of producing formation.

The Back-Pressure Method

In such cases as wells producing considerable gas with the oil it is necessary to give consideration to all of the factors in Equation 5, either by measuring the pressure directly with a bottom-hole-pressure gage or by determining the three constituents of bottom-hole pressure separately. Casing pressure, under any desired condition, can be obtained directly by use of suitable gages.

As shown by C. P. Walker in U. S. Patent 2,161,733, knowing the pressure at the well head and the specific gravity and temperature of the gas in the annulus, the pressure at the liquid surface may be computed from the following formula:

$$\text{Log}_{10}\,P_b = \frac{SD}{122.82T} + \text{Log}_{10}\,P_t \qquad (10)$$

where:

P_b = pounds per square inch absolute at bottom of gas column (at liquid surface)
S = specific gravity of gas
D = length in feet of gas column
T = mean temperature of gas, degrees Fahrenheit, absolute
P_t = casinghead pressure, pounds per square inch absolute

By controlling the casing pressure, many wells can be produced without an appreciable quantity of liquid in the annulus and in such cases bottom-hole pressure may be determined from casing pressure and gas-column pressure. Where it is impossible or impractical to lower the liquid level to the pump or tubing perforations, consideration must be given to the liquid in the annulus. The determination of the pressure due to the weight of the liquid involves the establishment of two or more stable liquid levels while maintaining a constant rate of production. In this manner casing pressure is substituted for liquid pressure and, by dividing the change in pressure at the liquid surface by the change in liquid level (feet), the column density may be determined. The average density will normally remain constant, if the production rate is constant. The total pressure of the liquid column may be computed by multiplying the column density by the height of the column above the desired datum point. Such datum point must be at or above the tubing perforations. Any change in annular area may affect the column density of the liquid and if there is a liner in the well a separate determination for this section may be required.

By adding the total liquid-column pressure to the pressure determined by Equation 10 the bottom-hole pressure at that particular rate of production is obtained. When bottom-hole pressure has been determined for two or more stable rates of production, the well capacity may be computed from Equations 3 and 4.

Tests From Fill-Up Data

Liquid-level measuring equipment provides a readily available and quick method of obtaining fill-up data on a well. Many wells which produce very little gas and which can ordinarily be tested from liquid-drawdown data above, can also be tested adequately by use of fill-up data. The method has not been widely used, however, and sometimes does not give satisfactory results.

The theoretical factors in the procedure for determining capacities from fill-up were expressed by Muskat in an A.I.M.E. paper published in 1936.

Economics of Liquid-Level Measurements

The advantages of conducting well tests without interfering with production, are readily apparent.

The service cost of testing a pumping well, in Kansas, varies from approximately $40 where liquid-level data alone are used, to approximately $140 for a back-pressure test requiring the use of a compressor. Labor cost varies from $10 to $25 depending on the type of test.

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Acknowledgments

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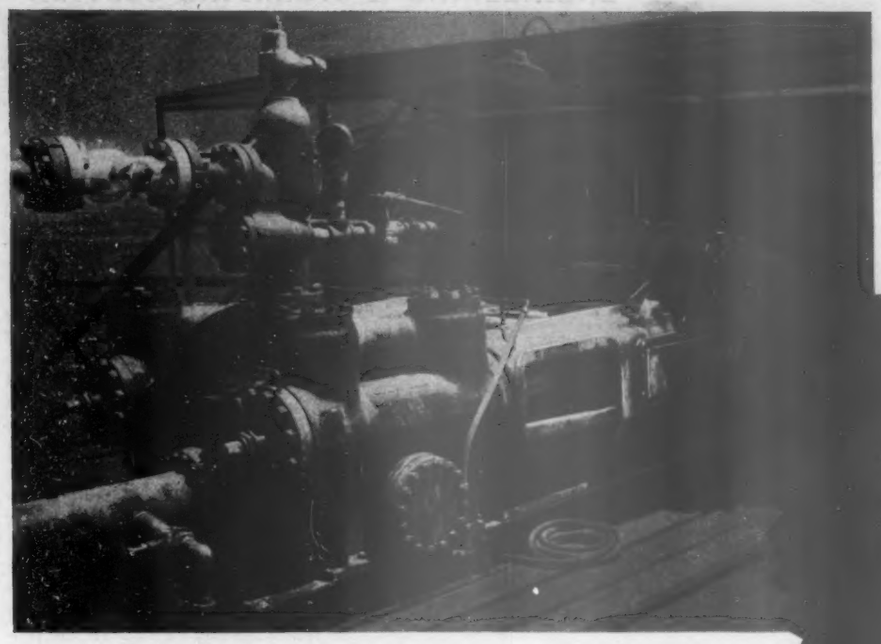
The Depthograph Co., George Vaughn, manager, Great Bend, Kans.
The Halliburton Oil Well Cementing Co.



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REFINERY ACTIVITY AND EXPANSION

Additional Plant Facilities At Sheboygan

The Wisconsin Oil Refining Co., Inc., is planning the construction of additional plant facilities at its Sheboygan, Wis., refinery to include thermal cracking, reforming and catalytic polymerization. The refinery, which was completed in 1940, has a crude-oil capacity of 6,000 bbl. daily.

Blown Asphalt Still Being Installed

The Shallow Water Refining Co. is installing a blown asphalt still at its Garden City, Kans., refinery. The refinery has a crude-oil capacity of 2,000 bbl. daily and a 250-bbl. cracking still.

Plan to Increase Capacity

The Petroleum Specialties, Inc., has under consideration plans to increase the crude-oil capacity of its refinery located at Flat Rock, Mich., from 3,000 to 4,000 bbl. daily. The refinery operates a Dubbs cracking still with 750 bbl. daily capacity.

Average Motorist Contributes Toward Aviation-Fuel Program

PHILADELPHIA, Pa.—Most automobile owners haven't realized it, but they have already started to contribute to the huge stock of 100-octane aviation gasoline with which the United States proposes to win the war.

This contribution is being made in a new war time motor gasoline, now being sold at most gasoline stations, according to Robert H. Colley, president of Atlantic Refining Co.

"The new war-time gasoline starts just as easily on a cold morning, and in most automobiles will give just as much performance and yield just as much mileage. For that reason 95 per cent of the automobile owners will not notice there is a difference between it and the gasoline they bought a couple of weeks ago at the service station on the corner," Mr. Colley explained.

"All gasoline blends are a complex mixture of petroleum compounds. Part are found naturally in crude oil. Others are products of the 'cracking' process. Some have a fairly high octane rating. But usually other substances have to be added to give the blend a sufficiently high anti-knock value. In most cases tetraethyl lead is the substance used. In others additional high-octane petroleum products are added.

"Both these added substances are needed by the Government to assure adequate reserves of aviation gasoline to meet any possible emergency and to obtain the amounts required, the precious tetraethyl lead supplies have been rationed and the high-octane petroleum products requisitioned.

"In order to produce a gallon of high-test aviation gasoline it is necessary to strip 16 gal. of motor gasoline of these high-octane components. To this is added a petroleum hydrocarbon of very high octane value, manufactured from one of the choice components stripped from motor gasoline. Then a final small dose of tetraethyl lead is used to bring the fuel up to the 100-octane mark.

"That explains the difference between the motor gasoline now being sold and that sold a few weeks ago. That difference represents the motorists' contribution to keep American planes flying and help win the war."

Refinery Group to Discuss Emergency Plant Short Cuts

EL DORADO, Ark., Feb. 10.—The regular technical group meeting of the North Louisiana-Arkansas division of the Western Petroleum Refiners Association to be held at El Dorado, Friday, February 13, will be devoted to a symposium on "Emergency Mechanical Short-Cuts." The symposium, which will be followed by a round-table discussion by the refinery operators, will be led by J. B. Rogerson, superintendent of refining for Lion Oil & Refining Co.

New Polymerization Plant Completed by Pure Oil Co.

BEAUMONT, Tex.—Pure Oil Co. has a new thermal polymerization plant at its Smith's Bluff refinery, near Nederland, south of Beaumont, Tex. The plant, engaged in the production of high-octane gasoline for aviation stock, is the second largest of its kind, and operates on gases recovered from other refinery operations.

Nyhagen Holds Every Position

R. S. Nyhagen holds every position in the operation of a small topping plant at Cut Bank, Mont. Replying to a questionnaire regarding his operations Mr. Nyhagen advised: "We produce and refine 10,000 bbl. of crude oil yearly. We pay $9,000 in taxes each year and not 1 cent for labor. I am also lease boss and pumper." He lists Mrs. Nyhagen as assistant superintendent. The property is operated under the name of Sandgren and Nyhagen.

Reduced Volume Pinching Pacific Coast Refiners

LOS ANGELES, Calif.—Several independent refineries in California may go on the idle list in the near future unless changes are forthcoming. The small differential existing between crude and refined-oil prices is causing a severe pinch on a number of small refiners and this, together with a substantial decline in commercial sales, is causing some concern. It has not been considered possible to continue operations if gasoline volume declines because the unit cost of manufacturing, including overhead and transportation expenses, practically prohibits operation on a reduced scale. A large number of independent refiners suspended operation in Los Angeles Basin last year due to inability to operate at a profit under existing price scales.

Lakeside Refining Co. Adding Catalytic Desulfurization Unit

KALAMAZOO, Mich.—According to an announcement made by L. W. Brummit, president, Lakeside Refining Co. is constructing a 600-bbl. capacity Perco catalytic desulfurization unit. This unit will process Michigan straightrun gasoline. This operation is being installed to materially raise the octane rating and tetraethyl lead susceptibility of the plant's gasoline production.

New Fractionating Towers Complete

The Empire State Oil Co. has completed the construction of new fractionating towers and condensing equipment at its Thermopolis, Wyo., refinery. The water-tube boilers of 500 hp. each are being installed at the plant which has a crude-oil capacity of 1,500 bbl. daily.

Reforming Plant Under Construction

The Aurora Gasoline Co., Detroit, Mich., has a 1,200-bbl. reforming plant of the Dubbs type under construction at its Detroit refinery. The refinery has a crude-oil capacity of 5,000 bbl. daily with a 1,500-bbl. Dubbs cracking plant. The plant is located at 15,911 Wyoming Avenue in Detroit. The company also operates a 3,000-bbl. topping plant at Elsie, Mich.

Sketches of Plant Operators . . .

T. A. HELLING, or "Ted" as he is better known, is vice president and general manager of the El Dorado Refining Co., with offices at El Dorado, Kans. Although still a young man, he is one of the "old timers" in the Mid-Continent refining fraternity.

His introduction to the company was through the hard way. He entered as a clerk in the office and that came in 1918. Although the job could have been handled on a "watch-the-clock" basis, this man refused to work that way and gradually his superiors delegated additional duties and responsibilities to him. His successful handling of these new details proved to be the grooming for greater responsibilities given him later. That came in 1921 when he was elected to the job he now holds.

The men in the plant there say that a day seldom passes in which "Ted" doesn't show up at some time each day or night. In addition, he has many "outside" interests such as vice president and director of the El Dorado National Bank, a director of the Independent Refiners Service Corp. and always lends a willing hand in civic affairs.

His hobby is raising white-faced cattle on his farm and his principal recreation comes in hunting. He likes to refer to having last year bagged a large bull elk in the Jackson Hole country of Wyoming.

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Pipe-Line Activity

Plans for Big Lines Are Considered

At the same time there is a need for providing extensive lines for expanding facilities for supplying natural gas to serve industrial centers, the country is forced to give consideration to proposals for laying a trunk line from Texas to the East Coast. It is reported that the requirements of gas lines have special importance for manufacturing war material; for this reason efforts will be made to expedite these projects during the first part of the year. Tanker sinkings and withdrawal of tankers to serve as floating storage and for supplying military and naval undertakings promise to lead to a shortage of tankers for supplying the East Coast which will mean that provision for pipe-line transportation to that area will be seriously discussed as a 1942 construction project.

Completion of Michigan Gas Lines Is Delayed

Originally scheduled for completion by February 15, the 45-mile 12½-in. natural-gas transmission line being built by Panhandle Eastern Pipe Line Co. to Flint, Mich., may not be completed before April 1 or later. Delays have been caused by inability to secure delivery on pipe and by bad weather conditions. The 45-mile line into Flint from Consumers Power Co.'s Zilwaukee, Mich., gas terminal is the first link of a proposed 250-mile pipe-line program to enlarge natural-gas facilities in Michigan. When the new system is completed Flint, Pontiac, Jackson, Kalamazoo and other war industry cities will draw an estimated 70 per cent of their gas needs from the Texas reserve and 30 per cent from Michigan reserves. Two gangs are now engaged on Panhandle Eastern's Michigan construction program. Work has started on the laying of the 20-in. pipe for the expansion of the system which was planned last year.

Atlantic Cuts Pipe-Line Runs Because of Tanker Shortage

The Atlantic Pipe Line Co. announced that it would reduce its take of crude oil from West Texas and New Mexico by 22½ per cent.

Company officials said the action was made necessary by the water-transportation situation to the East Coast brought about by government requisitioning of the company's tankers and also by the danger of submarine sinkings. The firm's refineries are on the East Coast.

The cutback will be about 7,200 bbl. from the present daily take of 32,000 bbl.

Eastward Rail Shipments Of Crude Break Records

The petroleum industry moved a record 164,700 bbl. of oil daily to the East by tank cars in the week ended January 31, Petroleum Coordinator Ickes reported.

The rail movement amounted to 5,125 cars, as compared with the high record of the week of October 18, when 4,396 cars moved an average of 141,300 bbl. daily into the 17-state area in the eastern part of the country.

Wisconsin Hearing May Determine Status of Natural Gas Pipeline

MADISON, Wis.—Whether or not the Natural Gas Pipeline Co. of America will be excluded entirely from a foothold in Wisconsin as a result of the provisional certificate issued to the Wisconsin Gas Transmission Co. authorizing it to construct a Wisconsin pipe line may be determined at a hearing here February 10.

The Wisconsin Public Service Commission announced the hearing on an application by the Wisconsin Southern Gas Co. to build a 3-in. pipe line, about 10½ miles long, from Lake Geneva, Wis., to the Illinois State line, where it would connect with the Natural Gas Pipeline system.

Natural Gas Pipeline Co. of America has nearly completed looping half its 24-in. line from the Texas Panhandle to Chicago with 26-in. pipe to enlarge its system sufficiently to serve Wisconsin markets. A 20-in. lateral has been laid to a point near the Wisconsin boundary. This work was started before state authorities denied the company permission to enter Wisconsin.

Phillips Wishes to Build Hobbs, N. M.-Borger, Tex., Line

WASHINGTON, D. C., Feb. 10.—Recommendation from the Office of Petroleum Coordinator is

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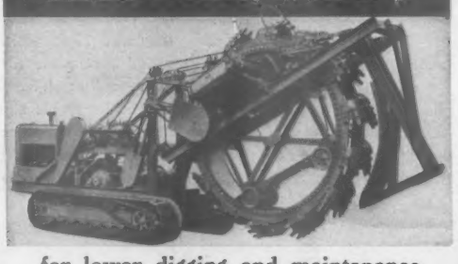

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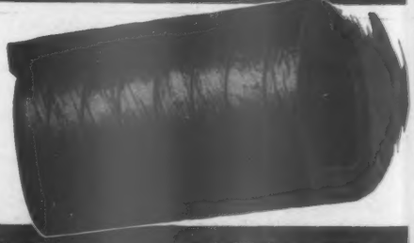

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Pipe-Line Personalities . . . . . T. E. Swigart

T. E. SWIGART, president, Shell Pipe Line Corp., came into pipeline operation from oil production. On graduation from high school at Oakland, Calif., he went to Stanford University, where he received an A.B. degree in 1917 and an engineering degree in 1918. During the summers of his college years he worked for Standard Oil Co. of California and Shell Oil Co. (California) in pipe-line, refinery, exploration, and production operations. In World War I he took the Special Officers Training Course at U. S. Naval Academy, Annapolis, Md.

From 1919 to 1924 he was with the U. S. Bureau of Mines as petroleum engineer, Bartlesville, Okla.; assistant to chief petroleum engineer, Washington, D. C., and superintendent of Petroleum Experiment Station, Bartlesville, Okla. While on furlough from the U. S. Bureau of Mines in 1923-24, he was consulting petroleum engineer for oil interests operating in India and Burma. Since then he has been continuously with Shell operations, first as chief production engineer from 1924 to 1928, and then as assistant general field superintendent in charge of production from 1928 to 1932 with Shell Oil Co. (California). In 1932 he was transferred to the Houston headquarters of the organization, now designated as Shell Oil Co., Inc., where he became vice president in charge of exploration and production operations in Texas, New Mexico, Louisiana and Arkansas. On September 1, 1940, he was transferred from this position to the presidency of Shell Pipe Line Corp. He has visited oil fields in Alsace, Rumania, Trinidad, and Venezuela as well as those of India and Burma. Mr. Swigart has been an active member of various committees of the producing division of A.P.I. and is a member of professional engineering societies. He is chairman of the board of directors, Houston Symphony Society; a director of the Houston Community Chest, and is a member of the general board of directors, Mid-Continent Oil and Gas Association. He is also secretary of the transportation committee of District 3, working under the petroleum coordinator at Washington, D. C. Mr. Swigart is married and has two children. His daughter, Patricia, is attending the University of Texas, while his son, T. E., is a student at T.A.&I. at Kingsville, Tex.

pending final decision before the War Production Board on allocation of 8-in. pipe for what will be primarily a natural-gasoline line from Hobbs, N. M., to Phillips Petroleum Co.'s refinery at Borger, Tex.

The proposed line would be 240 miles in length and would transport butanes and other hydrocarbons derived from Phillips' natural-gasoline plants in vicinity of Hobbs, N. M., to Borger, Tex., where they would be converted to components necessary to make 100-octane gasoline.

In addition to the 240 miles of 8-in. main line, there would be a considerable mileage of gathering arteries for the collection of desired hydrocarbons at the gate of the trunk system.

Special Board Will Consider Tapco Trunk-Line Plan

The controversial "Tapco" pipe-line proposal, to carry crude oil from a point near Wichita Falls, Tex., to Savannah, Ga., will be given a hearing by a three-man board set up by Joseph B. Eastman, director of defense transportation.

This proceeding is assigned for hearing before the board at 10 o'clock a.m. on February 19, 1942, at the office of the Interstate Commerce Commission, in Washington, D. C.

The proposed line of Trans-America Pipe Line Corp. is intended for operation as a common carrier to handle the output of independent producers. Petroleum Coordinator Ickes recently criticized the plan, declaring there was insufficient refinery capacity in the Savannah area to make the pipe line worth while.

Report Shows Increase in Pipe-Line Shipments

The Interstate Commerce Commission announced Saturday that transportation revenues of the nation's 44 major pipe-line companies totaled $59,925,116 in the third quarter of 1941 (July to September) compared with $53,232,280 in the comparable 1940 period, an increase of 12.6 per cent.

The number of barrels of oil originated on line and received from connections totaled 391,660,397 in the third quarter of 1941. This compared with 321,007,094 in the same period of 1940.

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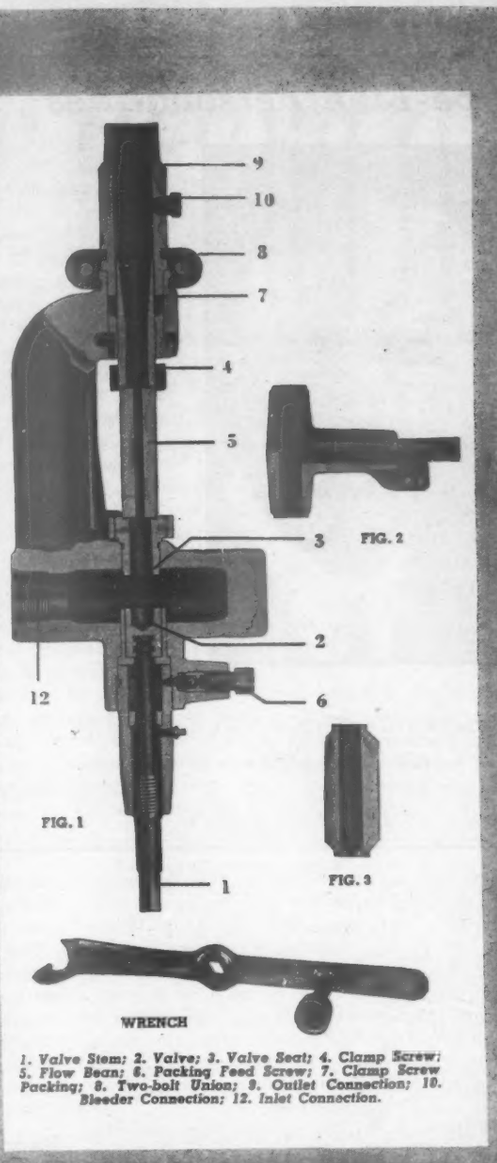
FLOW WINGS AND FLOW MANIFOLDS

The new Cameron Flow Wings and Flow Manifolds for Xmas tree service combine in single units the double function of conventional wing valves and quick-change positive or adjustable flow beans. The valve section of these units permit a quick and easily operated shutoff while changing chokes without the necessity of closing any vital valves on the tree. Flow beans may be changed quickly without breaking out a single threaded or flanged connection. All parts are readily replaceable in the field without removing the assembly from the well. Their compact design saves considerable steel and while these units provide several distinct operating advantages they actually cost substantially less than conventional assembled Xmas tree flow wings.

Referring to Figure 1 at right, to change flow bean fit hexagon socket in the wrench to valve stem (1) and close valve (2) against seat (3). Spanner part of wrench is then applied to clamp screw (4), and only two turns required to release flow bean (5). New bean is clamped in place by clamp screw and valve is then opened and well is back on production. Both the valve stem and valve seat are faced with hard metal to resist cutting. Valve stem and bonnet are packed with plastic packing which may be replenished under pressure. Clamp screw is packed with an asbestos ring (7) which is tightened automatically as the flow bean is clamped in place. Two-bolt union (8) obviates need for additional union in flow line. Note that the downstream end of the clamp screw is belled to reduce turbulence and cutting. Three types of flow beans are interchangeable in this unit: (1) the "proration" bean illustrated in the flow wing; (2) the adjustable flow bean illustrated in Figure 2; and (3) the "production" type bean which consists of a body and renewable stellite orifice disc. All of the flow beans clamp in position as shown in Figure 1.



1. Valve Stem; 2. Valve; 3. Valve Seat; 4. Clamp Screw; 5. Flow Bean; 6. Packing Feed Screw; 7. Clamp Screw Packing; 8. Two-bolt Union; 9. Outlet Connection; 10. Bleeder Connection; 12. Inlet Connection.

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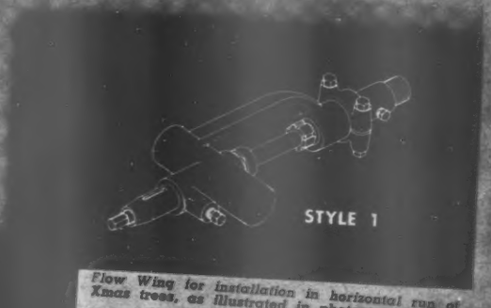
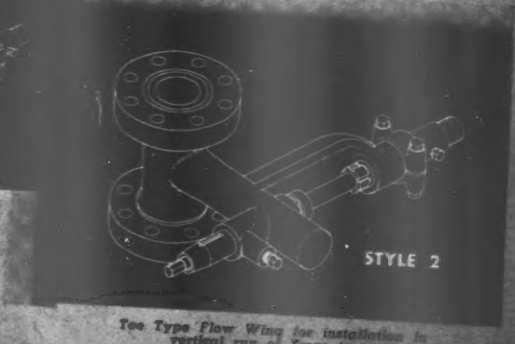
Oklahoma: Paul Edkin, Tulsa
Rocky Mountain: Mountain Sales & Service, Casper, Wyo.



Flow Wing for installation in horizontal run of Xmas trees, as illustrated in photograph above.

Cross Type Flow Manifold for installation in vertical run of Xmas trees.

Tee Type Flow Manifold for installation in horizontal run of Xmas trees.



Tee Type Flow Wing for installation in vertical run of Xmas trees.

FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

After M-68 has been in effect about 6 weeks, its restrictive effects are apparent in last week's decline of 124 in the number of completions. There were 91 fewer oil wells, while gas wells and dry holes were down 3 and 30 respectively. Declines were scattered because of the assistance given gas producers in the East by OPC's permission to complete all wells started prior to December 23 and also because of the prevalence of 40-acre spacing in some areas.

New locations and operations are sharply down. Kansas reports only eight new locations for the week. In Illinois, operations are down 57 per cent from last December. The number of permits issued in Michigan so far this year is 50 compared with 88 during the same period of 1941. Of the 258 active operations in the state only about one-third were actually drilling or in completion stages. East Texas reports two locations at Hawkins and no wildcats.

In an attempt to spur wildcatting, a bill has been introduced into Congress which provides for payment of 12½ per cent royalty during the first 10 years of the life of leases taken out on the public domain. At present, royalties average around 16 2/3 per cent. Leases on structures which are now producing are exempt. This does not appear to provide a great deal of encouragement for the wildcatter and even less for the conservationist. It means that once a lease is obtained, it must be drilled up as rapidly as possible and as much oil as possible must be removed from it during the first 10 years of its life. After that, production may be down to the point where the sliding scale will keep royalties at 12½ per cent. This situation is further complicated by the 40-acre spacing rule and also by the fact that some fields in Wyoming have had to wait for more than 20 years before a market could be obtained.

To introduce an additional complication to the stew is the suggestion that a state's production should be regulated according to the proportion of its nonstripper reserves to those of the country as a whole. If major fields were to be opened up as a result of this reduction in royalties and they were rapidly drilled up and proven because of the time limit involved, then the state would be entitled to greater production for which there would be no pipe-line facilities. It would appear preferable to drop the time limit and make the royalty a flat one-eighth on all government lands. With present tax burdens and the prospect of still more, one-eighth is all that most properties can stand. Removal of the time limit would permit proper development and sound production practices. The 10-year provision appears to put a premium on waste—not only of oil, but of steel. This bill is apparently not sponsored by OPC. It certainly does not fit into OPC's present plans. These are of necessity tied into the war economy which gives priority to other demands for steel over oil-well drilling. The need for 30,000 wells this year seems to have disappeared.

CALIFORNIA: After passing through a fault, which appears to cut the field in half, the second test at Turnbull Canyon was whipstocked and found two possible pay zones, one of which is new. Another gas field has been opened in the Semi-Tropic-Buttonwillow district of Kern County (p. 57).

TEXAS GULF COAST: A test of the Esperson dome attempted to blow out at 8,521 ft. The Mercy, San Jacinto County, discovery flowed 583 bbl. through ¼-in. choke from the Wilcox. Gas-distillate production in Lake Creek is extended to the southeast (p. 64).

NORTH LOUISIANA: A test east of Haynesville has picked up saturation in a deep lime pay which is believed to be above the Smackover. Considerable development is under way in the Pettit at Haynesville (p. 71).

SOUTHWEST TEXAS: Sejita is the latest gas-distillate field to develop oil production on the flank. An extension of major importance is recorded for Seeligson as regular pay is found 6 miles southwest of production. The Carrizo sand is showing oil in a wildcat south of Kenedy, Karnes County (p. 70).

LOUISIANA GULF COAST: Deep production has been found on the west flank of the Gueydan dome. Lakeside, Cameron Parish, has been extended to the northwest (p. 62).

WEST TEXAS: A flow of 120 bbl. was obtained from a new pay at 4,373 ft. in the Big Lake field in Reagan County. A new pool has been opened in the Clear Fork in Andrews County with the discovery well flowing 240 bbl. in 15 hours through choke (p. 54).

NORTH TEXAS: Clay County's new Caddo pool opener gaged 260 bbl. through choke and another Caddo pool is in prospect southeast of Jacksboro in Jack County (p. 64).

WEST CENTRAL TEXAS: Shackelford County has a new Tannehill sand pool northwest of Albany. Wimberly is extended west (p. 64).

INDIANA: Two small pool openers have been completed in Spencer and Gibson counties and a test near Evansville is showing oil in the Waltersburg (p. 69).

NEBRASKA: Saturation has been found in the Viola in the Dawson pool, Richardson County (p. 63).

EAST TEXAS Chapel Hill has been extended 1 mile to the east (p. 70).

ILLINOIS: A White County wildcat south of Storms is showing oil in the Benoist and McClosky while Aux Vases production has been found between Herald and South Maunie (p. 58).

ARKANSAS: With 12 wells drilling and another dozen locations staked the recently discovered Midway field in Lafayette County is one of the most active areas in the country (p. 71).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended February 7, 1942

	Oil	Gas	Dry	Total	Footage	Ttl. comp. to date 1942	Ttl. comp. to date 1941
N. Y., Pa., and W. Va.	69	11	3	83	172,032	597	500
Ohio	4	11	10	25	68,744	155	151
Indiana	1	0	2	3	5,437	60	42
Kentucky	0	0	3	3	5,361	55	62
Illinois	24	0	9	33	98,814	320	309
Michigan	9	3	2	14	36,109	95	88
Kansas	23	0	8	31	105,145	211	174
Nebraska	0	0	0	0	0	3	10
Missouri, Iowa	0	0	0	0	0	0	0
Oklahoma	17	11	10	38	128,447	195	148
Texas:							
North Central Texas	13	0	15	28	84,631	248	265
West Texas	30	0	7	37	158,228	246	211
Texas Panhandle	14	3	0	17	50,733	107	47
East Texas	5	1	3	9	41,391	69	125
Texas Gulf Coast	7	1	5	13	72,659	122	96
Southwest Texas	15	0	15	30	138,754	192	138
Total Texas	84	5	45	134	546,396	984	882
North Louisiana	5	0	5	10	30,455	88	67
Louisiana Gulf Coast	0	0	5	5	36,520	93	83
Total Louisiana	6	0	7	13	60,362	179	150
Arkansas	4	0	1	5	30,748	20	18
Mississippi and Southeast	0	0	0	0	0	19	20
Montana	2	0	0	2	4,846	21	30
Wyoming	0	0	0	0	0	8	19
Colorado	0	0	0	0	0	1	1
New Mexico	4	0	1	5	13,791	34	41
California	11	1	0	12	75,313	127	136
Total United States	257	42	104	403	1,359,458	3,086	2,781
Total previous week	348	45	134	527			
Week ended Feb. 8, 1941	300	43	118	461			

Big Lake Field Test Flowing From New Pay Horizon

By TOM BARBER

MIDLAND, Tex.—The Big Lake field of Reagan County, first Ordovician oil-producing area in the West Texas district, appeared to be in line for a new pay horizon. The field now produces from three levels. In addition to the Ellenburger lime (Ordovician), which is found around 8,500 ft., the Big Lake field also derives production from the Big lime (Permian) at 2,400 ft. and the Big Lake limestone (Permian) at 3,000 ft.

The new pay horizon was showing at Big Lake Oil Co. 19-C University, Section 24, Block 9, University Lands Survey, scheduled 8,500-ft. Ordovician test. No. 19-C University drilled to 4,373 ft. and at that depth flowed 120 bbl. of 43.5-gravity green oil in 1 hour through 3-in. tubing. No additional information has been released by the operator.

Ward County Activity

In the Spencer area of Ward County, two tests claimed attention. Three miles south of the Spencer pool, Stanolind 1 H. L. Byrd, Section 34, Block 34, H.&T.C. Survey, had plugged back from 2,880 ft. to 2,800 ft. On a 30-minute drill-stem test from 2,855-90 ft., 1 Byrd recovered 240 ft. of sulfur water. As a result, operator decided to plug back and test two upper sections which previously had indicated production possibilities.

A ½-mile southeast outpost to the Spencer pool, Stanolind 1-B Spencer, Section 53, Block 34, H.&T.C. Survey, gaged 10,720,000 cu. ft. of gas daily to indicate possible gas production for the field. The test is bottomed at 2,923 ft. Operator may either complete as a gas producer or drill deeper in search for oil production. Other wells in the pool are producing from a section of the Permian lime around 2,900 ft.

Pecos County Wildcat

Anderson-Prichard Oil Corp. 1 Humble-Bowen, Section 60, Block 10, H.&G.N. Survey, Pecos County wildcat, 2½ miles west of the southern part of the Apco-Warner pool in the northern part of the county, was reported, at the end of the week, running a drill-stem test of a section of the Ellenburger lime (Lower Ordovician). With elevation of 2,483 ft., 1 Humble-Bowen topped the Ellenburger at 4,917 ft. and cored porosity in deepening to 4,978 ft. Previously, the wildcat logged the detrital zone between the base of the Permian and the top of the Ordovician, at 4,890 ft.

NEW WILDCAT LOCATIONS

Dickens County: Humble 2 Matador, Sec. 5, Blk. 1, Shock & Arnold Sur., 660 ft. from W and S lines of section, Ordovician test.

Lubbock County: J. R. Sharp 1 T. A. Holman, 660 ft. from N and 1,980 ft. from W lines Sec. 12, Blk. B, J. H. Gibson Sur., 5,500-ft. test.

SOUTHERN WEST TEXAS COMPLETIONS

(24-hour rating based on last 3 hours of 6-hour gage)

Fields

Abell, Pecos County: Magnolia 2 Young-State, elev. 2,391 ft., 1,450 bbl., ½-in. choke, top McKee sand 5,199 ft., pay 5,234-43 ft.

Stanolind 1 Eugene Grove, elev. 2,387 ft., 166 bbl., 36 per cent water, pumping, 2,000 gal. acid 5,820-5,934 ft., top Ellenburger 5,770 ft.

Stanolind 1 C. R. Kistler, elev. 2,395 ft., 2,148 bbl., ½-in. choke, top Simpson 4,810 ft., top Tulip Creek 4,960 ft., pay 5,293-5,313 ft., T.D. 5,335 ft.

Abell (Permian), Pecos County: Skelly 1 Smith, elev. 2,377 ft., 577 bbl., ½-in. choke, pay 3,675-3,832 ft., T.D. 3,945 ft.

Apco-Warner, Pecos County: Humble 2 Shearer, elev. 2,437 ft., dry at 5,356 ft., top detrital 4,660 ft., top Ellenburger 4,700 ft.

Bean, Crockett County: Wahlenmaier & Curry 3 Bean, elev. 2,470 ft., dry at 1,447 ft.

Estes, Ward County: Tide Water 35 Johnson, elev. 2,591 ft., 47 bbl. oil and 4 bbl. water, ⅛-in. choke, 180-qt. shot 2,900-88 ft., T.D. 3,009 ft., old well drilled deeper, old T.D. 2,657 ft.

Harper, Ector County: Forest Dev. Co. 8-A Moss, elev. 2,919 ft., 418 bbl., 480-qt. shot 4,160-4,320 ft., top lime 3,940 ft.

Hendrick, Winkler County: Gulf 194 O'Brien, elev. 2,673 ft., 386 bbl., 590-qt. shot 2,595-2,750 ft., T.D. 2,771 ft.

Johnson, Ector County: George O. Livermore 3-35 Johnson, elev. 3,006 ft., 420 bbl., ½-in. choke, 90-qt. shot 4,109-47 ft., T.D. 4,156 ft.

Keystone (Colby sand), Winkler County: Gulf 44 Keystone, elev. 2,971 ft., 86 bbl., 350-qt. shot 3,228-3,320 ft., T.D. 3,322 ft.

Parker Drilling Co. 4 Ward, elev. 2,882 ft., 161 bbl., ½-in. choke, 460-qt. shot 3,120-3,300 ft., T.D. 3,310 ft.

Lehn, Pecos County: Burk Royalty Co. 10-B Sullivan, elev. 2,439 ft., dry at 1,770 ft.

Burk Royalty Co. 9-C Sullivan, elev. 2,438 ft., 160 bbl., ½-in. choke, 80-qt. shot 1,695-1,711 ft.

McElroy, Crane County: Gulf 18 McElroy, elev. 2,552 ft., 166 bbl., pumping, 860-qt. shot 2,809-3,003 ft., T.D. 3,013 ft., old well drilled deeper, old T.D. 2,925 ft.

B. F. Weekley 4 University, elev. 2,597 ft., 628 bbl., pumping, 450-qt. shot 3,010-3,120 ft., T.D. 3,125 ft.

North Cowden, Ector County: Stanolind 3-D Midland Farms, elev. 3,066 ft., 640 bbl., 388-qt. shot 4,580-4,700 ft., T.D. 4,705 ft.

Sand Hills (Permian), Crane County: Gulf 35 Waddell, elev. 2,702 ft., 516 bbl., 13,500 gal. acid 4,484-4,640 ft.

Gulf 36 Waddell, elev. 2,619 ft., 538 bbl., 5,000 gal. acid 4,290-4,559 ft.

Taylor Link, Ector County: Lee Petroleum Co. 1-D University, elev. 2,505 ft., 101 bbl., pumping, 90-qt. shot 1,380-1,428 ft., T.D. 1,435 ft.

Toborg, Pecos County: Phil Brown 22 Tippett, elev. 2,503 ft., 12 bbl., pumping, pay 491-530 ft.

Todd Deep, Crockett County: Amerada 2-F Todd, elev. 2,507 ft., dry at 6,305 ft., top crinoidal lime 6,050 ft., top Ellenburger 6,282 ft.

Amerada 1-G Todd, elev. 2,377 ft., dry at 6,890 ft., top crinoidal lime 6,295 ft., top Ellenburger 6,792 ft.

Walker, Pecos County: Cities Service 2-B White & Baker, elev. 3,034 ft., 343 bbl., ⅜-in. choke, 90-qt. shot 2,090-2,119 ft.

Northern West Texas Gets New Permian Lime Pool

A deep Permian lime field in northwestern Andrews County was definitely assured this week as Fullerton Oil Co. 1 H. M. Wilson flowed naturally 240 bbl. of 40-gravity oil in 15 hours. Flow was through ¼-in. tubing choke with gas volume of 135,000 cu. ft.

After an initial treatment of 1,500 gal., No. 1 Wilson flowed 41 bbl. of oil the first hour and 33 bbl. of oil the second hour and continued to test. Gas volume was 350,000 cu. ft. daily.

The oil was cut 2 per cent by b.s. and acid water at the start of the gage. Production is being derived from a section of the Clear Fork lime (lower Permian), which some geologists have identified as the Wolfcamp formation. Depth of production is 7,215-75 ft. Operator plugged back from 8,005 to 7,280 ft., with 5½-in. casing set at 7,285 ft. Casing was gun-perforated from 7,215-75 ft., 2-in. tubing set at 7,280 ft. and packer at 7,147 ft.

As the week closed, operator re-treated with 4,000 gal. after completing initial test. No. 1 Wilson is located in the NE SW SE Section 15, Block A-32, P.S.L. Survey, 8 miles northwest of Shafter Lake.

Wildcats Drilling

Operator has drilled to 3,000 ft. in anhydrite and red rock at Magnolia 1 Scanlon, Section 113, Block M, E. L. Survey, Dawson County wildcat 2 miles northeast of the Cedar Lake field. With elevation at 3,142 ft., 1 Scanlon logged the top of the anhydrite at 2,163 ft.

In Yoakum County, 4 miles west of Plains, Dunigan & Brahaney 1 Henard, Section 367, Block D, J. H. Gibson Survey, is drilling below 4,840 ft., with no shows reported. The wildcat is 1 mile NE of a failure drilled by Bahan & Rhodes.

George Livermore 1 Moxley, Lubbock County wildcat, drilled ahead below 5,683 ft., at the end of the week, after coring from 5,646-56 ft., recovering 4 ft. of lime, porous but carrying possible sulfur water, and 1 ft. of hard gray lime. The wildcat is contracted to 6,000 ft. and is located in Section 64, Block 20, H.E.&W.T. Survey.

NORTHERN WEST TEXAS COMPLETIONS

(24-hour rating based on last 3 hours of 6-hour gage)

Wildcats

Borden County: Texas Pacific Coal 1 Miller-Looney, elev. 2,702 ft., dry at 3,939 ft., top Yates 1,910 ft., top brown lime 3,030 ft., top solid lime 3,333 ft.

Gaines County: Likins & Hall 1 E. H. Jones, SW SW Sec. 13, Blk. A-7, P.S.L. Sur., dry at 6,438 ft., top San Andres 4,750 ft.

Fields

Emma, Andrews County: Atlantic and Sun 6-C Holt, elev. 3,119 ft., 279 bbl. oil and 31 bbl. water, 800-qt. shot 4,470-4,750 ft., top anhydrite 1,800 ft., top Yates 3,050 ft., T.D. 4,760 ft.

Seaboard 2 Thornberry, elev. 3,218 ft., 366 bbl., 1-in. choke, 5,000 gal. acid 4,352-4,500 ft., top anhydrite 1,560 ft., top Yates 2.880 ft., top San Andres 4,347 ft.

Seminole, Gaines County: Magnolia and Atlantic 4-193 H. & F., elev. 3,319 ft., 573 bbl., ¼-in. choke, 130-qt. shot 5,135-5,200 ft., T.D. 5,214 ft.

Magnolia 4-B Mallett, elev. 3,621 ft., 1,156 bbl., 3-in. casing outlet, 500 gal. acid 4,977-5,040 ft.

Slaughter, Cochran County: Honolulu 21-8 Igoe & Smith, elev. 3,664 ft., 748 bbl., 2.7 per cent water, 10,000 gal. acid 4,970-5,045 ft.

Magnolia 22-J Mallett, elev. 3,645 ft., 1,274 bbl., 3-in. casing outlet, 10,500 gal. acid 4,975-5,050 ft.

Slaughter, Hockley County: Magnolia 14-D Mallett, elev. 3,601 ft., 1,064 bbl., 3-in. casing outlet, 10,500 gal. acid 4,940-5,000 ft.

Magnolia 9-F Mallett, elev. 3,597 ft., 1,274 bbl., 3-in. casing outlet, 10,500 gal. acid 4,996-5,027 ft.

Texas 24-E Mallett, elev. 3,594 ft., 1,502 bbl., 4 per cent water, 12,000 gal. acid 4,975-5,035 ft.

Texas 91 Slaughter, elev. 3,547 ft., 1,711 bbl., 12,000 gal. acid 4,920-5,017 ft.

Texas 92 Slaughter, elev. 3,579 ft., 1,217 bbl., 12,000 gal. acid 4,965-5,025 ft.

Texas 95 Slaughter, elev. 3,565 ft., 2,589 ft., 14,000 gal. acid 4,968-5,040 ft.

Wasson, Yoakum County: Drilling & Exploration Co. 7-C Hudson, elev. 3,652 ft., 491 bbl., ⅞-in. choke, 9,000 gal. acid 4,915-5,110 ft.

TEXAS PANHANDLE

AMARILLO, Tex.—A total of 17 completions were recorded in the Texas Panhandle district during the week. Of these, 14 were oil producers and 3 were gas wells. Total daily potential of the new producers amounted to 2,301 bbl. of oil. Total gas volume for the three gas wells was 73,000,000 cu. ft. daily.

There were only nine new locations made this week. Hutchinson County counted with seven new locations, while Carson and Gray counties had one new test each.

TEXAS PANHANDLE COMPLETIONS

Carson County: Cities Service Oil Co. 5 Fields, Sec. 13, Blk. 7, I.&G.N. Sur., 120 bbl., 3,240-3,286 ft.

Dyke Oil Co. 5 J. L. Noel, Sec. 187, Blk. 3, I.&G.N. Sur., 120 bbl., 220-qt. shot, 3,152-3,282 ft.

Gray County: Phillips 5 Tay, Sec. 24, Blk. B-2, H.& G.N. Sur., 122 bbl., 360-qt. shot, 2,935-3,031 ft.

Skelly Oil Co. 9 Lovett, Sec. 36, Blk. B-2, H.&G.N. Sur., 284 bbl., 420-qt. shot, 2,945-3,011 ft.

Hutchinson County: Buffalo Oil Co. 3 Crockell, Sec. 3, Blk. M-21, T.C. Sur., pumped 197 bbl. oil and 10 bbl. water, 420-qt. shot, 2,980-3,106 ft.

J. M. Huber Corp. 7 Bryan, Sec. 2, Blk. M-24, T.C. Sur., 249 bbl., 3,000 gal. acid, 3,212-36 ft.

J. M. Huber Corp. 4 Bryan, Sec. 2, Blk. M-24, T.C. Sur., pumped 82 bbl., 2,000 gal. acid, 3,212-49 ft.

McIlroy Oil Co. 5 Tomlinson, Sec. 24, Blk. M-23, T.C. Sur., 218 bbl., 18 per cent water, 625-qt. shot, 3,100-85 ft.

Pennowa Oil Co. 4 Perkins, McDaniel Sur., 276 bbl., 330-qt. shot, 3,015-98 ft.

Phillips 2 Katherine, William Cole Sur., 8,600,000 cu. ft. gas, 255-qt. shot, 2,870-3,160 ft., P.B. from 3,208 ft.

Cy Riger 2 Merchant, Sec. 32, Blk. 47, H.&T.C. Sur., pumped 25 bbl., 4,000 gal. acid, 2,683-2,720 ft.

Shamrock Oil & Gas Corp. 1 Lucas, Sec. 6, Swisher Sur., pumped 60 bbl. oil and 15 bbl. water, 3,257 ft.

(Continued on Page 58)

Second Turnbull Canyon Test Finds Two Possible Pays

By L. P. STOCKMAN

THE Turnbull Canyon field of Los Angeles Basin, which was discovered a few months ago by Continental Oil Co., looks a lot better today than it did last week. This sudden change is due to the fact that Continental has since uncovered 320 ft. of excellent oil sand in 2 Turnbull Community. This oil sand is at 3,470-3,800 ft. A little gray sand was found in the bottom of the hole and a short cement plug was dropped in to take care of the sand in case it carried water. In this well, the company has found two separate oil zones, whereas in the discovery well only one zone was encountered above a gray sand. There is a shale break between the two new zones found in 2 Turnbull Community at 3,520-3,680 ft. The top zone, comparable with that which is producing in the discovery well, contains a crude oil testing 22 gravity but the lower zone, not heretofore encountered contains oil testing 33 gravity. This changes the complexion of the Turnbull Canyon field even in spite of the faulting in the southern part of the area. No. 2 Turnbull Community, which is located several hundred feet south and west of the discovery well, drilled into a fault at 3,700 ft. and the company was obliged to plug back to 2,000 ft. from which depth a whipstock directed the hole to the northwest with the results indicated above. The fault in the southern end of the Turnbull Canyon field trends northwest to southeast and at present appears to cut the potentially productive acreage in half although there is much to be learned about this area.

LOS ANGELES BASIN COMPLETIONS

Dominguez, Los Angeles County: R. E. Havenstrite 4 Larronde, 32-3s-14w, flowed 86 bbl., 31.2-gravity, 0.5 per cent cut, 32/64-in. bean, pressures 75/150 lb., T.D. 7,636 ft., redrilled to 7,190 ft., perf. 7,108-90 ft., well failed to maintain flow, rig to pump; this is one of four wells on Larronde lease which were killed by earthquake on October 21, 1941; well was flowing about 200 bbl. daily when killed by pinching off of casing and tubing.

Huntington Beach, Orange County: Texas Co. 2 Smythe, 34-5s-11w, pumped 25 bbl., 20.9-gravity, 30 per cent cut, T.D. 4,489 ft., cleaned out to 4,480 ft., perf. 4,280-4,300 ft., 4,325-30 ft., 4,395-4,425 ft., reconditioned and returned to production in same zone.

Whittier, Los Angeles County: Union 13 Sansinena, 30-2s-10w, flowed 1,800,000 cu. ft. gas, 36/64-in. bean, S.I. pressures 620/620 lb., T.D. 4,143 ft., P.B. 2,627 ft., gun perf. 2,090-2,120 ft., complete in gas zone when lower part of hole failed to yield oil.

Wilmington, Los Angeles County: Exeter Oil Co. 2 Banning, 32-4s-13w, pumped 162 bbl., 13.6-gravity, 10 per cent cut, T.D. 3,615 ft., redrilled to 3,605 ft., gravel-packed perf. 2,668-2,873 ft., 2,927-3,136 ft., 3,260-3,603 ft., recompleted in Ranger zone after hole gravel packed.

Outpost Staked Southeast Of Coalinga

Drilling operations in the Coalinga field of Fresno County have been reduced to the point where there are only eight strings of tools in operation and this number will be reduced by operation of M-68 and P-98 within a short time. There are very few locations available for work within the present limits of the productive area that will afford 40 acres upon which to drill and get beyond prohibitive limitations. R. S. Lytle, operating as a unit for Seaboard, Honolulu, and former Petroleum Securities stockholders has staked location for an outpost to be drilled southeast of present production. This will be an important well because it is quite possible that commercial production may be developed. Technically this wildcat will be drilled in the Guijarral Hills which lie about midway between the Southeast Coalinga and Kettleman North Dome fields. Mr. Lytle's new wildcat will be drilled in 28-20s-16e, and an early spud will be made as this is wildcat territory and is not therefore subject to restrictions such as prevail in proved fields. Two wildcats have already been drilled in Section 28 but it is quite possible they were not carried deep enough. Dana Hogan drilled his 1 Ladd to a depth of 6,605 ft. before hanging up tools. This well was located along the east side of the section. In the southwest quarter of the section, Petroleum Securities drilled its Ladd wildcat to 7,382 ft. Neither of these wells showed productive possibilities of an exceptional nature and each was drilled before the Northeast and Southeast Coalinga productive areas were developed. As a matter of fact Petroleum Securities started its original wildcat activity southeast of the present Southeast Coalinga field and subsequently moved northwest and discovered production at Southeast Coalinga.

Bowerbank Test Yields Gas

Texas Co. has apparently found a commercial gas accumulation in the Bowerbank district of Kern County as wells in this region which is located west of Greeley and southeast of the Semitropic and Buttonwillow gas fields have looked rather good during the past week or 10 days. The company is working on two deep tests, 4-23 Bowerbank which was carried down to 12,144 ft., and 47-15 Southern Pacific which was bottomed at 12,138 ft. Both of these wells were carried down in search of oil production but failed to find commercial production. Both have been plugged back to the shallow gas zones from which tests are now being made. No. 47-15 Southern Pacific, which was plugged back to 4,220 ft. or rather cleaned out to that depth after abandonment of the lower portion of the hole on a test early this week, was good for 7,000,000 cu. ft. of gas per day. A string of 1¼-in. tubing was landed in this well with a packer and the well showed a shut-in tubing pressure of 1,750 lb. The company's 4-23 Bowerbank, in 23-29s-24e, was redrilled to 4,850 ft. and this well looks good for about 15,000,000 cu. ft. of gas. It is a little too early to venture an opinion that Texas has found a new productive gas field but if the showing of wells in the two gas zones is any criterion the area will bear watching.

Shafter Test to Be Redrilled

Continental Oil Co. is having more than a run of tough luck in the Shafter field of Kern County as it has been found necessary to back up from 9,949 ft. to 1,100 ft. and undertake a redrilling job in 1 Newman in 36-27s-24e. This well, the second which Continental has started in the Shafter district, encountered pipe trouble that could not be overcome. The 9⅝-in. casing, cemented at 9,150 ft., went bad and collapsed so completely that a redrill job was found necessary. Continental's discovery well at Shafter also ran into considerable trouble before being completed and necessitated two redrill jobs before drilling was finished.

SAN JOAQUIN VALLEY COMPLETIONS

Coalinga Southeast, Fresno County: R. S. Lytle 23-7-F, 7-20s-16e, flowed 1,805 bbl., 32.8-gravity, 0.5 per cent cut, 1,225,000 cu. ft. gas, 21/64-in. bean, pressures 1,100/1,425 lb., T.D. 7,172 ft., perf. 6,702-75 ft., 6,812-7,115 ft., Kreyenhagen 5,604 ft., green sand 6,638 ft., completed in Gatchell oil sand of Eocene age.

Standard 26-31-B fee, 31-19s-16e, flowed 2,044 bbl., 29.1-gravity, 0.1 per cent cut, 1,380,000 cu. ft. gas, 48/64-in. bean, pressures 1,050/1,225 lb., T.D. 8,108 ft., 60-mesh perf. 7,695-8,041 ft., green sand 7,525 ft., oil sand 7,697-8,040 ft., bottomed in silt, completed in Gatchell zone of Eocene age.

Standard 52-31-B fee, 31-19s-16e, flowed 2,470 bbl., 26.9-gravity, 0.1 per cent cut, 1,347,000 cu. ft. gas, 48/64-in. bean, pressures 1,050/1,150 lb., T.D. 8,194 ft., 60-mesh perf., 8,128-92 ft., green sand 8,037 ft., oil sand 8,143-94 ft., completed in Gatchell oil zone of Eocene age.

Raisin City, Fresno County: Shell 31-19 S. A. & F. L., 19-15s-18e, flowed by heads 70 bbl., 35.2-gravity, 0.1 per cent cut, 32/64-in. bean, T.D. 5,077 ft., P.B. 5,033 ft., perf. 5,021-32 ft., recompleted in Shell zone of Miocene age.

Strand, Kern County: Shell 83-12 Shell-Ohio, 12-30s-25e, flowed 656 bbl., 35.5-gravity, 12 per cent cut, 459,000 cu. ft. gas, 18/64-in. bean, tubing pressure 875 lb., T.D. 8,842 ft., P.B. 8,515 ft., perf. 8,425-74 ft., 8,500-15 ft., N point 8,008 ft., first Stevens oil sand 8,232 ft., second Stevens oil sand 8,281 ft., third Stevens oil sand 8,420 ft., bottomed in gray sand 8,496-8,515 ft., completed in Stevens zone of Miocene age.

Ventura Depth Record Broken Again

The Ventura Avenue field of Ventura County continues to occupy the spotlight because last week Tide Water Associated Oil Co. had the deepest well in the field when 18 McGonigle reached a depth of 11,350 ft. This week Shell exceeded this depth with 1-A Shell Lloyd which reached a depth of 11,516 ft. Tide Water Associated Oil Co. should break the deep production record for Ventura Avenue within the next few days as 18 McGonigle is being prepared for a production test. Shell, however, may break this record for depth of production within a short time thereafter, as 1-A Shell-Lloyd has been showing up with increasing oil and gas on the ditch. The present formation in 1-A Shell Lloyd, however, is sand and shale and it remains to be seen whether sufficient oil sand has been or will be found to produce commercially. This well was drilled by Shell Oil Co., Inc., for Ralph Lloyd several years ago but only showed relatively small production. Subsequently, Ralph Lloyd as a personal adventure drilled a deep hole and secured an excellent flowing well. Shell decided after completion of Lloyd's last big well to attempt to drill 1-A Lloyd to or below the depth attained by Ralph Lloyd. This has been done and it remains now to be seen whether this deeper drilling will be productive of satisfactory results.

COASTAL DISTRICT WILDCATS

Del Valle, Los Angeles County: Standard 2 Sepulveda, 17-4n-17w, flowed 75 bbl., 33.2-gravity, 3 per cent cut, 60,000 cu. ft. gas, 16/64-in. bean, pressures 200/600 lb., T.D. 5,838 ft., cleaned out to 5,820 ft., perf. 5,790-5,805 ft., completed in Jasper zone of Miocene age.

Gato Ridge, Santa Barbara County: Petrol Corp. 661 Magenheimer, 4-8n-32w, pumped 475 bbl., 16.2-gravity, 2 per cent cut, T.D. 4,204 ft., perf. 3,373-3,525 ft., 3,559-98 ft., 3,608-28 ft., 3,638-3,909 ft., 3,947-87 ft., 4,008-4,127 ft., 4,147-89 ft., well may show substantially larger production when put on steady production.

San Miguelito, Ventura County: Continental 24 Grubb, 23-3n-24w, flowed 784 bbl., 33.1-gravity, 0.5 per cent cut, 570,000 cu. ft. gas, 16/64-in. bean, pressures 1,600/1,700 lb., T.D. 7,110 ft., perf. 5,779-5,904 ft., 5,924-6,014 ft., 6,034-6,164 ft., 6,194-6,334 ft., 6,364-6,469 ft., 6,489-6,659 ft., 6,689-6,889 ft., 6,919-7,109 ft., completed in Grubb zone of Pliocene age.

Santa Maria Valley, Santa Barbara County: Hancock-Bush 4 Wylie, 25-10n-34w, pumped 675 bbl., 13.5-gravity, 2 per cent cut, T.D. 4,917 ft., perf. 4,358-4,914 ft., completed in Santa Maria Valley zone of Miocene age.

Macrate & Sons 7 Fernandez, 26-10n-34w, flowed 550 bbl., 16.1-gravity, 3 per cent cut, 48/64-in. bean, pressures 250/300 lb., T.D. 4,320 ft., completed open hole in Santa Maria Valley zone of Miocene age.

Pacific Western 9 Hobbs, 21-10n-34w, pumped 312 bbl., 15.8-gravity, 3 per cent cut, T.D. 4,692 ft., perf. 4,246-4,684 ft., completed in Santa Maria Valley zone of Miocene age.

Ventura Avenue, Ventura County: Shell 145 Taylor, 29-3n-23w, flowed compressor 140 bbl., 25.2-gravity 25 per cent cut, T.D. 8,100 ft., perf. 6,162-6,527 ft., 6,565-6,689 ft., 6,730-7,386 ft., 7,426-7,581 ft., 7,642-7,723 ft., 7,763-7,975 ft., 8,014-96 ft., completed in 3 zones of Pliocene age.

Discovery Rate Maintained With Two New Pools Showing

MATTOON, Ill.—Perhaps the one bright spot in the entire Illinois basin is White County where two prospective pool openers were near completion last week to maintain the almost weekly discovery rate established late in 1941. One of the prospective pool openers was the Carter Oil Co. 1 Marlin, SW NW 35-6s-9e, about 2 miles south of the Storms field. On a 2-hour drill-stem test of the McClosky at 2,998-3,096 ft., gas and oil-cut mud rose in the hole to give promise of production. Another test was run to 3,031 ft. and 450 ft. of free oil was recovered. No. 1 Marlin also recovered saturation in the Benoist sand which has not yet been tested.

Even brighter prospects were shown at Minerva Oil Co. 1 Ramsey, N½ SW NE 33-6s-10e, which is being completed as a producer in the Aux Vases sand. On a drill-stem test of this formation at 2,903-14 ft., 1,410 ft. of oil and 90 ft. of drilling mud were recovered. No. 1 Ramsey is about midway between the Herald and South Maunie pools.

Dix Field Extended

Marion County's lone operation last week, Frazier & Stephens 1 Vangilder, SE 33-1n-2e, appeared to be successful after operations cored fair saturation in the Benoist. If the well is successfully completed it will extend the Dix pool of Jefferson County a short distance northward into Marion. Pay was encountered at 1,965 ft. and operators are expected to run casing within the next few days.

Perry County Active

Four wildcats were under way in Perry County last week bringing activity in that county to a peak for the past several months and representing the largest increase in activity anywhere in the basin. Most important of these tests was the Harsh 1 Newborn, SE SE NW 22-4s-1w, which was scheduled for a shot in the Cypress at about 1,126 ft. The Benoist, Aux Vases and McClosky were apparently dry in this test and it is now being completed tight. However, it will apparently be completed in the Cypress.

Meanwhile, activity elsewhere in the basin continued to drop and total operations at the end of the week were reported to be 213, a decline of 26 for the previous week. This represents a decline of nearly 57 per cent in total operations since December 23.

ILLINOIS COMPLETIONS

Wildcats

Edwards County: A. F. Dye 1 W. S. Tull et al, E½ SE SE 13-1n-10e, dry at 3,308 ft., Menard 2,358 ft., Waltersburg 2,405 ft., Vienna 2,464 ft., Tar Springs sand 2,483 ft., Glen Dean 2,602 ft., Hardinsburg 2,624 ft., Golconda 2,628 ft., Barlow 2,810 ft., Cypress sand 2,890 ft., Paint Creek 2,953 ft., Benoist 2,980 ft., Renault 3,050 ft., Aux Vases sand 3,132 ft., Ste. Genevieve 3,155 ft., McClosky 3,228 ft.

Jackson County: H. A. Hoffman 1 Bowlan, SE SE NE 12-7s-2w, dry at 1,595 ft., Kincaid 665 ft., Menard 935 ft., Tar Springs 1,115 ft., Glen Dean 1,175 ft., Golconda 1,558 ft., Cypress 1,425 ft., Paint Creek 1,557 ft.

Jefferson County: Magnolia 1 Riddle Bros., NE SE SW 8-3s-1e, dry at 3,860 ft., Menard 1,367 ft., Waltersburg 1,410 ft., Glen Dean 1,555 ft., Hardinsburg 1,608 ft., Golconda 1,655 ft., Barlow 1,759 ft., Cypress 1,771 ft., Cypress sand 1,804 ft., Benoist 1,969 ft., Aux Vases sand 2,052 ft., Ste. Genevieve 2,150 ft., Rosiclare 2,170 ft., McClosky 2,225 ft., Salem 2,560 ft., Osage 3,025 ft., Chattanooga 3,635 ft., Devonian 3,705 ft.

Cherry & Kidd 1 Giordano, NW SW SE 33-1s-1e, dry at 2,402 ft., Menard 1,455 ft., Waltersburg 1,419 ft., Vienna 1,560 ft., Tar Springs 1,572 ft., Glen Dean 1,657 ft., Golconda 1,762 ft., Barlow 1,837 ft., Cypress sand 1,886 ft., Paint Creek 1,918 ft., Benoist 2,035 ft., Aux Vases sand 2,120 ft., Ste. Genevieve 2,200 ft., Rosiclare 2,220 ft., Fredonia 2,285 ft., McClosky 2,326 ft., St. Louis 2,399 ft.

Richland County: Zephyr Drlg. 1 Simpson-Poff, W½ NW SW 30-2n-11e, dry at 3,364 ft., Menard 2,407 ft., Vienna 2,528 ft., Glen Dean 2,671 ft., Barlow 2,860 ft., Renault 3,105 ft., Ste. Genevieve 3,217 ft.

Wayne County: Reward et al 1 Arcola, NE NW SE 29-2s-6e, dry at 3,220 ft., base Pennsylvanian 2,138 ft., Menard 2,363 ft., Waltersburg 2,503 ft., Vienna 2,549 ft., Tar Springs 2,555 ft., Glen Dean 2,652 ft., Hardinsburg 2,708 ft., Golconda 2,756 ft., Barlow 2,877 ft., Cypress sand 2,992 ft., Paint Creek 3,024 ft., Paint Creek sand 3,052 ft., Benoist 3,141 ft., Renault 3,183 ft., Aux Vases 3,192 ft., Aux Vases sand 3,198 ft.

Fields

Dale, Hamilton County: Texas 1 W. Clark, SW SW NW 8-6s-7e, pumped 64 bbl., 50-qt. shot 3,004-29 ft., Aux Vases sand 2,983-99 ft., 3,011-21 ft., T.D. 3,031 ft.

Texas 2 W. Clark, NW SW NW 8-6s-7e, pumped 284 bbl., 60-qt. shot 2,997-3,027 ft., Aux Vases 2,970-78 ft., 2,983-88 ft., 3,005-22 ft., T.D. 3,031 ft.

Carter 4 I. Hale, SW SE NE 1-6s-6e, dry at 3,045 ft., Glen Dean 2,392 ft., Barlow 2,673 ft., Renault 2,998 ft., Aux Vases 3,010 ft., Ste. Genevieve 3,041 ft.

Epworth, White County: National Pet. 5 McQueen, NE NW SW 32-5s-10e, pumped 46 bbl., 15-qt. shot 2,104-11 ft., Clore 2,092-2,111 ft., T.D. 2,111 ft.

Fairfield, Wayne County: Ohio Fuel Supply 1 P. C. Hill, S½ SE NE 2-2s-7e, swabbed and flowed 432 bbl., perf. casing 3,298-3,307 ft., 3,218-3,307 ft., 3,238-48 ft., 2,000 gal. acid in McClosky, 1,500 gal. acid in Levias, Levias 3,239-47 ft., McClosky 3,300-08 ft., T.D. 3,324 ft., P.B. 3,309 ft.

Johnsonville, Wayne County: Olson Drlg. 2-B States, E½ SW SW 36-1n-6e, pumped 4 bbl. oil and 30 bbl. water, perf. 3,211-17 ft., McClosky 3,212-16 ft., T.D. 3,389 ft.

Junction City, Marion County: N. W. Whitton 1 Fyke, SW NE SW NW 32-2n-1e, pumped 10 bbl. oil and 5 bbl. water, 20-qt. shot 656-94 ft., T.D. 694 ft.

Louden, Fayette County: Carter 5 E. McCormick, SE NW SE 18-7n-3e, pumped 45 bbl., 20-qt. shot 1,577-85 ft., 10-qt. shot 1,598-1,602 ft., old well deepened from 1,580-1,602 ft.

Carter 1 Rhodes, NW NE SE 27-7n-3e, pumped 33 bbl. oil and 2½ bbl. water in 3 days, 10-qt. shot 1,537-77 ft., old well deepened from 1,563-79 ft.

Maunie South, White County: Sinclair 1 E. S. Ackerman, SE SW SW 13-6s-10e, pumped 20 bbl. oil and 24 bbl. water, 20-qt. shot 2,583-87 ft., perf. in Palestine 2,016-36 ft., T.D. 3,007 ft., P.B. 2,587 ft.

Mill Shoals, White County: Southern Pet. 2 McIntosh, NW NW SE 30-3s-8e, pumped 250 bbl., 80-qt. shot 3,194-3,223 ft., Aux Vases sand 3,193 ft., T.D. 3,284 ft.

New Harmony, White County: Mabee O. & G. 11 Smith, NE SE SW 4-4s-14w, pumped 35 bbl., 60-qt. shot on bottom, Benoist 2,677 ft., T.D. 2,733 ft.

Tide Water 11 Evans, SE SW NW 4-4s-14w, pumped 52 bbl. in 13 hr., 50-qt. shot 2,796-2,816 ft., reamed casing in Benoist, Aux Vases sand pay 2,801-11 ft., Benoist 2,672-84 ft., T.D. 2,965 ft.

North Benton, Franklin County: Smokey 2 Sisk, NW NW NE 1-6s-2e, dry at 2,724 ft., Glen Dean 2,187 ft., Paint Creek 2,586 ft., Benoist 2,686 ft., Aux Vases sand 2,710 ft.

A. W. Torbett 1 Biggs, NW SW NE 1-6s-2e, pumped 87 bbl., natural, Paint Creek 2,605-10 ft., T.D. 2,889 ft.

North Boos, Jasper County: Schulman Bros. 2 Acklin, NW NW SE 5-6n-10e, pumped 100 bbl., 5,000 gal. acid, McClosky 2,772-76 ft., 2,785-88 ft., T.D. 2,802 ft.

Omaha, Gallatin County: Carter 3 S. Rister, NW SE NW 4-8s-8e, pumped 54 bbl., 40-qt. shot in Cypress, 11-qt. shot 1,649-1,707 ft. in Palestine, old well deepened from 1,724-1,940 ft.

Parkersburg, Edwards County: Central P. L. and Martin 1 Bidgley, E½ NW SE 31-2n-14w, flowed 875 bbl. oil and 175 bbl. water, 3,000 gal. acid, pay 3,109-18 ft., Ste. Genevieve 3,044 ft., T.D. 3,118 ft.

Roland, White County: Magnolia 3 General American Life, SE SW SW 1-7s-8e, pumped 200 bbl., natural, Waltersburg 2,196-2,211 ft., Aux Vases sand 2,921-30 ft., T.D. 2,935 ft.

Magnolia 2 General American Life, NW SW SW 1-7s-8e, pumped 310 bbl., natural, Waltersburg 2,203-18 ft., Paint Creek sand 2,751 ft., T.D. 2,774 ft.

Cities Service 8 Mount, SE NW NW 12-7s-8e, pumped 125 bbl., 40-qt. shot 2,197-2,206 ft., Waltersburg 2,188-2,204 ft., T.D. 2,917 ft., P.B. 2,206 ft.

Carter 1 Leathers, NE NE NE 11-7s-8e, pumped 300 bbl., 20-qt. shot 2,162-67 ft. in Waltersburg, old well worked over, T.D. 2,751 ft.

Rural Hill, Hamilton County: Shell 5-B J. F. Crabtree, NE NW NW 24-6s-5e, flowed 440 bbl. oil and 15 bbl. water, perf. 3,326-34 ft., 3,292-3,318 ft., 3,244-64 ft., 3,220-30 ft., 3,152-78 ft., 1,000 gal. acid in lower McClosky, reacidized 3,000 gal., 2,500 gal. acid in upper McClosky, Aux Vases sand 3,076-3,100 ft., Levias 3,152-76 ft., McClosky 3,246 ft., T.D. 3,338 ft.

Shell 1-C L. F. Lockwood, NW NE NW 24-6s-5e, flowed 630 bbl. oil and 10 bbl. water, perf. 3,314-34 ft., 3,258-78 ft., 3,167-92 ft., 2,000 gal. acid in McClosky, Aux Vases sand 3,100-18 ft., McClosky 3,168-90 ft., 3,260-78 ft., 3,316-26 ft., T.D. 3,361 ft.

Texas 1 V. Johnson, NW SW NW 18-6s-6e, flowed 640 bbl., perf. 3,275-80 ft., 3,363-73 ft., 3,248-55 ft., Aux Vases sand 3,170-84 ft., 3,186-3,219 ft., Levias 3,349-54 ft., 3,274-80 ft., McClosky 3,360-76 ft., T.D. 3,380 ft.

Shell 7-B Crabtree, SW SW SW 13-6s-5e, flowed 440 bbl., perf. 3,170-98 ft., 3,278-90 ft., 3,308-24 ft., Aux Vases sand 3,097-3,154 ft., Levias 3,172-94 ft., 3,281-86 ft., McClosky 3,310-32 ft., T.D. 3,353 ft.

(Continued on Page 63)

Texas Panhandle

(Continued from Page 54)

Stanolind 1 Starnes, Sec. 24, Blk. M-23, T.C. Sur., 156 bbl., 508-qt. shot, 3,100-91 ft.

Moore County: Phillips 1 Rueter, Sec. 200, Blk. 3-T, T.&N.O. Sur., 62,500,000 cu. ft. gas, 5,000 gal. acid, 2,820-3,045 ft.

Wheeler County: H. L. Guild 4 Sloss, Sec. 90, Blk. 13, H.&G.N. Sur., 265 bbl., 2,060-72 ft.

Magnolia 6 Koons, Sec. 43, Blk. 24, H.&G.N. Sur., 127 bbl., 2,415-51 ft.

Smith Bros. 15 Johnson, Sec. 34, Blk. 24, H.&G.N. Sur., 1,900,000 cu. ft. gas, 2,155-2,355 ft.

Southeast New Mexico Wildcat to Start

HOBBS, N. M.—Drilling is scheduled to start immediately at Mascho Oil Co., Midland, and American Drilling Corp., Hobbs, 1 Tide Water Associated-State, new wildcat 7 miles west of Tatum in north central Lea County.

The test was located in SW NW 18-12s-35e, on a farmout from Tide Water. That firm and L. H. Wentz, Ponca City, are donating acreage and bottom-hole money toward the well. F. J. Danglade and Continental Oil Co. are contributing acreage, while Skelly Oil Co. and Texas Pacific Coal & Oil are purchasing spreads.

Contract calls for 5,200 ft. unless production or sulfur water in the lime is encountered at a shallower point. Location falls less than a half mile north of the old Holmes & Huey 1 State, which stopped at 1,870 ft.

SOUTHEAST NEW MEXICO COMPLETIONS

Wildcats

Eddy County: F. E. Baker and Bob Helms 1 State, 32-19s-27e, dry, sulfur water in sandy lime 1,020-30 ft., T.D. 1,250 ft.

Fields

Grayburg, Eddy County: Bassett & Birney et al 7-B State, NE NW SW 11-18s-29e, flowed 44 bbl. through ¼-in. choke on 2-in. tubing set at 2,670 ft., pay 2,652 ft., T.D. 2,676 ft.

Mattix, Lea County: Western Gas 2 Bates, NE NW 18-24s-37e, flowed 180 bbl. through ⅛-in. choke on 2½-in. tubing set at 3,576 ft., pay sand 3,500 ft., T.D. 3,580 ft.

Vacuum, Lea County: Texas 5-AC State, SW SE 2-18s-34e, flowed 140 bbl. through open tubing, pay 4,435 ft., T.D. 4,715 ft.

INTERPRETATION OF GEOLOGIC MAPS AND AERIAL PHOTOGRAPHS, by A. J. Eardley, University of Michigan, Ann Arbor, Mich. 99 pages, price $1.50.

This book is intended to present the fundamentals of the interpretation of geologic maps and aerial photographs and condenses a great deal of valuable information into a small space. It is plentifully illustrated with both photographs and geologic maps and interpretations of aerial photographs in terms of geologic features.

Those who are considering the value of aerial mapping in reconnaissance would do well to study this little volume and to see how various lines of evidence can be followed to depict structures that might not be picked up by the geologist on the ground. Despite the fact that it is designed as an elementary text, the geologist who has had some experience with aerial photographs might find additional slants on the subject which would more than repay him for the time necessary to read this book.

Congress Gets Bill to Modify Public Land Lease Policy

By T. R. INGRAM

DENVER, Colo.—A proposed compromise between the Department of the Interior and operators on the public domain on the question of royalties on oil and gas production on federal land is seen in a bill (S. 2239) introduced in the Senate by Senator O'Mahoney of Wyoming. The measure provides that until the war is concluded by a treaty of peace, all leases under Section 17 of the General Leasing Act of February 25, 1920, when the land is not within any known geological structure of a producing oil or gas field, shall provide that during the first 10 years of such lease the royalty shall be 12½ per cent in lieu of the present royalty under that section. Holders of leases shall be granted new leases in exchange for the old upon application.

The controversy has been over the question of royalties on government land in the light of the need for discoveries of new sources of supply. The policy of the Government to encourage wildcatting, in the opinion of operators on the public domain, is handicapped by the present royalties which average 16⅔ per cent. For several years the Independent Petroleum Association of America, the Rocky Mountain Oil and Gas Association, and others, have consistently sponsored a movement for a flat royalty of 12½ per cent on the public domain.

This movement was accentuated last August when the Senate public lands subcommittee, sitting in Denver, directed H. Leslie Parker, of Denver, with the aid of the Rocky Mountain oil men, to prepare and submit an oil and gas lease form applicable to the public land states which they believed fair to all sides and an aid to national defense. This form was submitted, but certain divisions of the Department of the Interior contended that 16⅔ per cent was fair and reasonable.

Recently the petroleum coordinator, the deputy coordinator, and the director of production of the Office of Petroleum Coordinator announced that the crude reserves must be augmented as an aid to national defense. This was quickly followed by a resolution favoring the promulgation of the new lease form which was adopted by the Petroleum Industry Production Committee for District 4.

While it is contended that the secretary of the interior, if he so chose, could make the desired changes without further legislative authority, the divergence of opinions has held up any such action and the O'Mahoney bill is the result. It is apparently a compromise by which wildcatting could be encouraged without interfering with present leases in producing fields inasmuch as it applies only to wildcat land.

Utah Producing Firm Organized

The Wasatch Production Co., a subsidiary of the Wasatch Refining Co., which operates a refinery at Woods Cross, Utah, and is interested in other western refineries, has been organized to enter the producing field and has acquired the 6,000-acre unit of the North La Barge Oil Co., in Sublette County, Wyoming; the Rex Lake field, Albany County, Wyoming; the producing acreage of the Mid-American Oil Co. in the Sheep Creek field, Fremont County, Wyoming, and 12,000 acres of potential acreage in the Big Piney district, Sublette County.

The North La Barge unit has six producing wells and a topping plant. Rex Lake has one producing well and two shut-in wells. It originally was developed by the Ohio Oil Co. and was acquired from Fred Goodstein and Joseph A. Minton. Two wells have been drilled to production in Sheep Creek. The consideration is reported to be around $250,000 with certain working agreements. W. H. McIntyre is president; Henry D. Moyle, vice president; Chester Davis, secretary-treasurer, and Joseph A. Minton, general manager of the new company.

Madison at Cut Bank

Big West Oil 1 State, C SE 6-34n-4w, in the midway district between Cut Bank and Kevin-Sunburst, which gaged 2,125,000 cu. ft. of gas in the Cut Bank sand, is being deepened to the Madison. It is ¾ mile southeast of same company's 1 Dahlquist, a discovery last year.

Tensleep at Shoshone

Husky Refining 2 Stump, SE SW SW 21-53n-101w, Cody (Shoshone) field, is being made into a Tensleep test. It is a semiwildcat ½ mile southeast of the Stock well, a producer in the Embar. It apparently is running 400 ft. higher than the well to the northwest, but the Embar was very

(Continued on Page 63)

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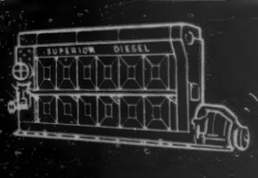

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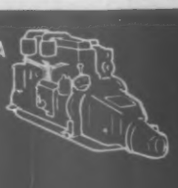

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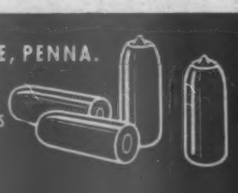

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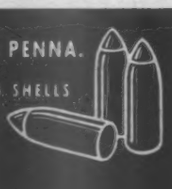

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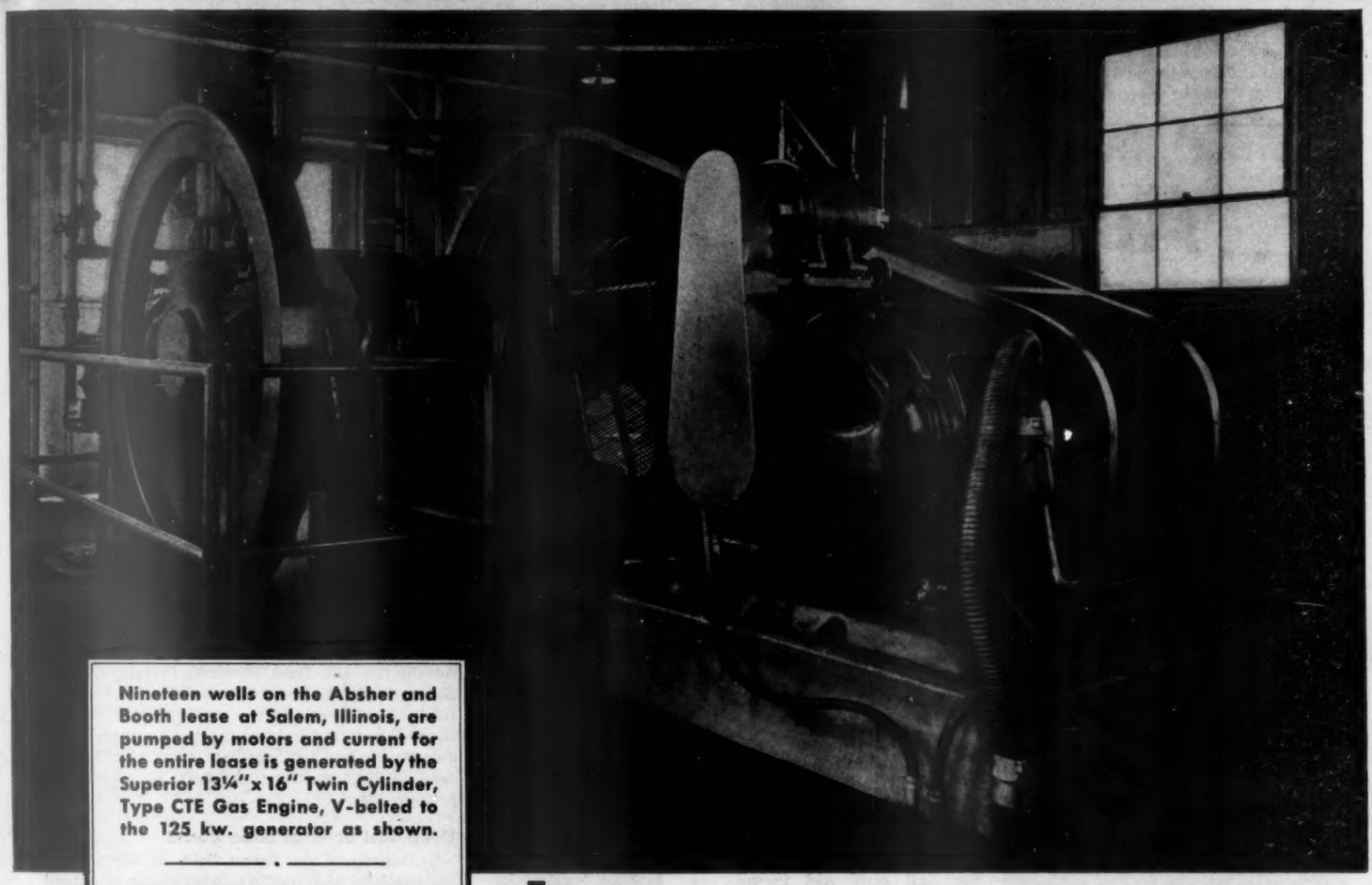

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LOUISIANA GULF COAST

South and West Flank Sands At Gueydan Dome May Join

By F. L. SINGLETON

NEW ORLEANS, La.—Exploration around the flanks of the Gueydan dome, Vermilion Parish, continued to open new production. The latest strike was made on the west flank where Pure Oil Co. 11 Alliance Trust Co., flowed at the rate of 300 bbl. of pipe-line oil daily through a 10/64-in. choke from casing perforated opposite oil sand at 9,850-92 ft. This sand correlates with one of the deep sands on the south flank, but whether production will be joined will have to be determined by further development.

Exploration around the flanks of the structure was started in 1940 and succeeded in opening distillate production on the south flank. Later development opened crude production at various horizons from 8,700 to 10,000 ft., while in 1941 new production was opened on the north flank by Fohs Oil Co.

Napoleonville Dome Test

Another deep test located on the northeast flank of the old Napoleonville dome, Assumption Parish, was attracting attention as George Echols 2 Armelise Planting Co.,-was shut down for orders after topping salt at 9,107 ft., and drilling the formation to a total depth of 9,131 ft. An electrical survey showed some resistivity at 8,438-43 ft., while side-wall cores at 8,942 ft. recovered sand with a good odor and cut, but whether the showing was sufficient to cement casing for testing was not revealed.

Bay De Chene Test

The Bay De Chine structure, La Fourche Parish, which was established as a salt-dome structure the past few weeks, is receiving additional development as Texas Co. moved in for 2-B La Fourche Basin Levee district. The well is 3,230 ft. northeast of 1-B La Fourche Basin, which encountered salt formation at 8,488 ft. The discovery well, located south of the abandoned hole, was completed as a dry gas well at 2,460-90 ft. after plugging back from a depth below 10,000 ft.

Second Sand at Thornwell

Hopes of opening distillate production on the Thornwell prospect, Jefferson Davis Parish, were discouraged again as Cities Service Oil Co. 1 Lacassine flowed salt water through a ⅛-in. choke from perforated casing at 9,854-58 ft. This is the second sand section to be tested, the hole having been plugged back from a total depth of 10,325 ft., where a series of tested showed gas, distillate and salt water. Several attempts to eliminate the salt-water flow failed.

Lakeside Extended

Although no gage was available, an extension of several hundred feet northwest was recorded for the Lakeside field, Cameron Parish, with the completion of Lisbon-Iberia 2 Calcasieu National Bank. Total depth of the well is 10,110 ft., and the well was shut in after flowing an unestimated amount of gas and distillate from the 9,800-ft. sand. Tubing pressure was 2,900 lb. and casing pressure 3,000 lb.

Deep Test at West Lake Verret

In the West Lake Verret field, St. Martin Parish, Shell Oil Co., Inc., was attempting to extend production in the 11,000-ft. sand as preparations were being made to test 2 Norman-Breaux. Total depth of the well is 11,500 ft., and it is testing through perforated casing at 11,484-96 ft. This is one of the few fields that produce pipe-line oil from a depth below 11,000 ft.

New Test at Erath

In the Erath field, Vermilion Parish, Humble Oil & Refining Co. is resuming development by the staking of 2 School Land, about ¾ mile northwest of the discovery well in 16-13s-4e. This is an interesting test for the field, as it is located south of two outpost tests which were abandoned as dry holes and the actual limits of production in this direction has been more or less undetermined.

LOUISIANA GULF COAST COMPLETIONS

Wildcats

Avoyelles Parish: Placid 1-A Southwestern Improvement Co., dry, T.D. 7,805 ft.
Placid 1-D Southwestern Improvement Co., dry. T.D. 7,474 ft.
Calcasieu Parish: Union 1 Gray, dry, T.D. 10,401 ft.
Rapides Parish: Carter Oil Co. et al 1-B State, Cathoula Lake, top Cockfield 1,370 ft., Cook Mountain 1,930 ft., Sparta 2,079 ft., Cane River 2,770 ft., Wilcox 2,868 ft., dry, T.D. 5,755 ft.
Vermilion Parish: A. Delcambre, 1 Ludovic, dry, T.D. 5,085 ft.

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Simpson Sand May Produce In Barber County Wildcat

By ROBERT INGRAM

ANOTHER attempt was to be made this week by Champlin Refining Co. to make a test of the Simpson section at 1 Hildebrand, E½ NE NW 26-32-15w, a wildcat in Barber County, some 8 miles southwest of the Lake City pool where Simpson production was recently opened.

The well topped Topeka at 3,280 ft.; Lansing, 4,160 ft., Mississippian lime 4,735 ft., Viola 4,931 ft., and Simpson 5,041 ft. An excellent show was reported in the Simpson, but the well was drilled to a total depth of 5,323 ft. after testing the Arbuckle at 5,185-91 ft. Seven-inch casing was set at 5,150 ft., but water broke in while bailing down and operators were attempting to squeeze.

Particular attention was being paid to the Simpson showing because of its regional significance. Barber County is on the edge of the Anadarko basin which spreads over Oklahoma to the south, and Simpson production at the northern part of the basin would further indicate pay from the same section in traps throughout the basin.

The Simpson pay at Lake City was opened by Pryor & Lockhart, Inc., and Luther Mackall 2-C Gant, N½ NE 18-31-13w. Sand was topped at 4,528½ ft. and penetrated to 4,451 ft.

Drilling Lags

Drilling was shut down at scores of wells in western Kansas last week pending an interpretation of the spacing requirements of M-68. Typical was the Atlantic Refining Co. well in the Iuka pool of Pratt County which was plugged on top of the sand, loaded with mud, and left standing. Only eight new wells were started, the smallest number for a 7-day period in Kansas since the industry assumed major status.

Arbuckle Showing in Stafford

Only a few wells held attention, and none of the wildcats under way had proven new production. In Stafford County, 3 miles north of the Max pool, Adair & Morton 1 Roberts, N½ NE NE 14-21-12w, had pipe stuck after getting a good show in the Arbuckle. Early in the week operators cut an 8-ft. core with bleeding saturation in the lower 7 ft. Total depth was 3,361 ft. The showing was reported as unusually favorable.

KANSAS COMPLETIONS

Wildcats

Jefferson County: W. D. Dunn et al 1 Everett, SE SE SW 36-8-19e, dry, Bartlesville 1,562 ft., Mississippi 1,586 ft., T.D. 1,800 ft.

Rice County: Nelson Drilling 1 Smyres, NE NE SW 36-19-6w, potential 3,000 bbl., flowed 38 bbl. in 4 min. through 1-in. choke, Lansing 2,778 ft., Mississippian 3,323 ft., first oil 3,339 ft., T.D. 3,354½ ft., *discovery.*

Fields

Abbyville, Reno County: Skelly 1 Love, S½ SW NE 24-24-8w, pumped 377 bbl., Lansing 3,526 ft., T.D. 3,543 ft.

Bowman, Rice County: Skelly 1 Knop, NE NE SW 21-19-10w, pumped and flowed 478 bbl., Lansing 3,111-26 ft., T.D. 3,229 ft.

Brandt, Butler County: Adair & Morton 3 Sawyer-A, SW SE SW 10-28-7e, pumped 375 bbl., Mississippi 2,734 ft., T.D. 2,748 ft.

Chase, Rice County: McPherson Drilling 4 Patton-B, NE SE SW 9-19-9w, T.D. 3,760 ft., salt-water-disposal well.

Cramm, Rice County: Lauck & Moncrief 2 Murphy, S½ SE NW 22-19-9w, potential 1,533 bbl. pumping, Arbuckle 3,208 ft., T.D. 3,219 ft.

Cunningham, Pratt County: Sinclair Prairie 4 Greider-B, SW NW NE 35-27-11w, swabbed and flowed 511 bbl. oil and 56 bbl. water, Lansing 3,456 ft., T.D. 3,505 ft.

Dunbar, Cowley County: Frank Phelps et al 1-A Asmussen, SE SE NW 29-30-5e, old well, old T.D. 2,293 ft., T.D. 2,300 ft., dry.

Fairport, Russell County: C. E. Liggett et al 1-A Abbott, W½ NW SE 29-11-15w, pumped 60 bbl. oil and 144 bbl. water, Lansing 3,115-17 ft., T.D. 3,271 ft.

Frog Hollow, Cowley County: Leader Oil 11 Moon, SE SW SW 16-32-5e, flowed 450 bbl. oil and 1,750,000 cu. ft. gas, Bartlesville 3,054 ft., T.D. 3,070 ft.

Gorham, Russell County: A. H. Witt 2 E. Witt, W½ W½ NE 7-14-14w, pumped 186 bbl., Lansing 3,101 ft., T.D. 3,183 ft.

Hall-Gurney, Russell County: Eldorado Refining 1 Phinney, S½ SE NW 19-14-13w, dry, Gorham 3,204 ft., T.D. 3,233 ft.

Magnolia 1 Ruby, S½ SW NE 25-14-13w, dry, Arbuckle 3,147 ft., T.D. 3,152 ft.

Skelly 2 T. B. Carter, N½ NE NE 33-14-13w, pumped 506 bbl. oil and no water, Lansing 2,860-64 ft. and 2,868-84 ft., T.D. 2,889 ft.

Iuka, Pratt County: Atlantic et al 2 Luders, E½ SW NE 11-27-13w, dry, Viola 4,199 ft., T.D. 4,303 ft.

Krier, Barton County: George Johnston et al 2 South Oeser, SW SW SW 30-16-11w, pumped 294 bbl. oil and some water, Topeka 2,897-2,904 ft., T.D. 3,142 ft.

Lake City, Barber County: Pryor & Lockhart et al 2 Gant-C, N½ N½ NE 18-31-13w, pumped 343 bbl., 47.6 gravity, Simpson sand 4,530 ft., T.D. 4,545 ft., *discovery of new horizon (others Arbuckle, one Viola well).*

Lost Springs, Marion County: T. C. Johnson and Magnolia, N½ SW NE 26-17-4e, swabbed 45 bbl., Mississippi 2,317 ft., T.D. 2,369 ft.

Padgett, Sumner County: E. B. Shawver 2 Padgett, C SW 23-34-2e, dry, Mississippi 3,462 ft., T.D. 3,576 ft.

Peace Creek, Reno County: Derby Oil 2 Mathes, NE SE SE 16-23-10w, pumped 436 bbl., Viola 3,753 ft., T.D. 3,785 ft.

Simpson & Taylor, NE SE NW 28-23-10w, flowed 3,000 bbl., Viola 3,794 ft., T.D. 3,803½ ft.

Northeast Peace Creek, Reno County: Leader Oil 1 McMurray, NE SE SE 10-23-10w, potential 3,000 bbl flowing, Viola 3,767 ft., T.D. 3,783 ft.

Cities Service 1 Heylmun, NE NE NE 15-23-10w, flowed 1,348 bbl. oil and 42 bbl. water, Viola 3,758 ft., T.D. 3,776 ft.

Ray, Phillips County: Cities Service 6 Johnson-B, NE SE SE 31-5-20w, dry, LaMotte missing, granite 3,590 ft., T.D. 3,591 ft.

Richardson, Stafford County: Veeder Supply 1 Hartnett, E½ NE NE 32-22-11w, dry, Arbuckle 3,636 ft., T.D. 3,654 ft.

Silica, Barton County: R. E. Hess 1 Schmidt, S½ SW SW 36-19-11w, old well, old T.D. 3,302 ft., Arbuckle 3,280 ft., ripped 3,082-3,103 ft., dry.

West Silica, Barton County: Iron Drilling 2 Bacon, S½ SE SW 8-20-11w, potential 395 bbl. pumping, Arbuckle 3,294 ft., T.D. 3,319½ ft.

St. John, Stafford County: Atlantic and Phillips 4 McNaughten-B, W½ E½ NW 21-24-13w, pumped 58 bbl. oil and 22 bbl. water, Lansing 3,734-55 ft. and Arbuckle 4,106-10 ft.

Stoltenberg, Ellsworth County: Aylward Production 3 Boye, N½ NE SW 9-16-10w, pumped 48 bbl. oil plus 15 per cent water, Arbuckle 3,303 ft., T.D. 3,305 ft.

Valley Center, Sedgwick County: Prunty Production 3 A. P. Wright, SW SW NE 12-26-1w, pumped 12 bbl. oil and 1,200 bbl. water, Viola 3,339 ft., T.D. 3,340 ft.

Miscellaneous

Elk County: Imo Oil & Gas 1 Porter, SW SE SW 24-28-8e, pumped 40 bbl., Arbuckle 2,906 ft., T.D. 2,913 ft.

Greenwood County: Pryor & Lockhart et al 1 Baker, SE NE SE 17-26-13e, dry, Mississippi 1,531 ft., T.D. 1,572 ft.

Saturated Viola Lime Indicates New Nebraska Pay Zone

ST. JOSEPH, Mo.—A Viola lime test is to be made in the Dawson pool of Richardson County, Nebraska, by the Power Oil Co. at its 1 D. E. Bohrer. Saturation was cored and pipe was cemented. If the lime pays this will be the first Viola production for Nebraska.

Skelly Oil Co.'s drilling program is going ahead in the Barada pool of Richardson County, though not with great speed. There is not much activity in the Falls City pool. In the McLouth pool of Jefferson County, Kansas, no new locations were announced the past week and existing tests were drawing to a conclusion. One test is under way to the Mississippi lime in the Polo pool of Caldwell County, Missouri. This is important in that it may reveal whether or not a buried Mississippi structure exists there. Gas pay to date comes from shallow sands.

Missouri Gas Field

Herman Leuring 1 F. B. Albright, E½ SE 32-55-28w, an outpost in the sprawling Polo gas field of Caldwell County, Missouri, was drilling at 815 ft. last week after topping the Polo sand at 389 ft.

The field, owned largely by Skelly Oil Co., has nine wells at present with a combined daily potential of 35,000,000 cu. ft. of gas. However, there is no market for the production which comes from the Polo sand at from 350 to 425 ft.

Wells are in 31, 32 and 33-55n-28w, and 25 and 36-55n-29w. There are two dry holes, one in 30-55n-29w and one in 36-55n-29w.

Rocky Mountain Area

(Continued from Page 59)

hard and tight and yielded only a little oil.

Extension at Wilson Creek

A slight extension of the developed area in the Wilson Creek field, Colorado, is imminent in the Texas-California 8 Unit on the northeast flank ¼ mile ahead of production. It cemented the 7-in. on top of the Sundance at 6,886 ft., has moved off rotary and is getting ready to test; total depth is 6,888 ft.

North Mahoney Dome

Sinclair-Wyoming 3-A Mahoney, C NW NE 34-26n-88w, an outpost on north side of Mahoney dome, deepened hole from 4,556 ft. after acidizing with 3,000 gal., to 4,627 ft., and is testing. It is reported to have made 30 bl. a day after acidizing.

MONTANA COMPLETIONS

Cut Bank field, Glacier County: Texas Co. 2 Miller, CWL NE NE 32-33n-5w, T.D. 3,000 ft., 7-in. 2,952 ft., small show oil in Sunburst 2,900-20 ft., Cut Bank sand 2,938-76 ft., main pay 2,970-76 ft., 800 ft. fluid, swabbed 35 bbl. first 8 hr.

Kevin-Sunburst field, Toole County: Nepstad-Montgomery-Fargher 4 Haugen-2, CSL SW SW 2-35n-3w, T.D. 1,846 ft., contact 1,845 ft., acid 500 gal., swabbed 300 bbl. first 24 hr., averaged 100 bbl. next 7 days.

MONTANA LOCATIONS

Cut Bank field: Indian Oil 2 Reickhoff, 660 ft. N/S, 187 ft. E/W, Lot 10, 3-34n-6w, drilling 810 ft., top Colorado 555 ft., 10¾-in. 578 ft.

Texas 5 Lindquist, NE SE SW 20-32n-5w, spudding.

Kevin-Sunburst field, Toole County: Coolidge & Coolidge 10-A State, SW NW NE 36-36n-2w, location.

Big West Oil 2 Carlson, NW NE NE 22-35n-3w, location.

J. H. Agen 19 Goeddertz, C NE SW 23-35n-3w, rigging up.

J. H. Agen 6 Goeddertz, NE SW NE 16-35n-3w, location.

NORTHWEST NEW MEXICO COMPLETIONS

Hospah field, McKinley County: Petroleum Products 23 Hospah, NW SE NE 1-17n-9w, pumped 26 bbl. first day from Hospah sand at 1,528-70 ft.

Illinois Fields

(Continued from Page 58)

Simms, Wayne County: Fotiades 2 L. Withraw, N½ NE NW 28-1s-6e, pumped 125 bbl., 16-qt. shot 3,048-54 ft., Aux Vases 3,034-52 ft., T.D. 3,064 ft.

Texas 5 B. Talbert, E½ NE SW 28-1s-6e, pumped 53 bbl. in 10 hr., perf. 3,143-48 ft., 3,152-61 ft., 2,000 gal. acid, 20-qt. shot 3,023-33 ft., Aux Vases sand 3,014-33 ft., Levias 3,077-80 ft., McClosky 3,144 ft., T.D. 3,266 ft.

South Noble, Richland County: Shaffer & Toler Drlg. 1 Taylor, N½ NW NW 33-3n-9e, dry at 3,115 ft., Menard 2,220 ft., Glen Dean 2,490 ft., Golconda 2,551 ft., Barlow 2,653 ft., Renault 2,940 ft., Ste. Genevieve 3,016 ft.

Walpole, Hamilton County: Texas 7 Irvin, W½ SW NW 26-6s-6e, pumped 164 bbl., 10-qt. shot 3,093-3,100 ft., Aux Vases sand 3,082-3,100 ft., T.D. 3,100 ft.

Texas 2 R. Hall, W½ SE NW 27-6s-6e, pumped 240 bbl., 40-qt. shot 3,078-98 ft., Aux Vases sand 3,070-98 ft., T.D. 3,098 ft.

Woodlawn, Jefferson County: McBride 3 McMillen, NW NW SW 36-2s-1e, salt-water-disposal well, Pottsville 892 ft., T.D. 1,217 ft.

NORTH CENTRAL TEXAS

Tanks Built for Official Test Of Clay County Discovery

By D. H. STORMONT

WICHITA FALLS, Tex.—Continental and Roy Lee 1 Watson, W. A. Farris Survey, has definitely opened a new Caddo oil pool in Clay County, about 2 miles north of the Henderson field. Operators were erecting storage for official Railroad Commission gage, after the well flowed 260 bbl. of oil in 8 hours through ¾-in. choke on tubing.

The test was shut in after cleaning into pits through various sized tubing chokes. Casing pressure was 350 lb. and tubing pressure 550 lb. The new discovery was bottomed at 5,484 ft. with casing set at 5,454 ft.

New Caddo Lime Pool

Joe Worsham 1 Sewell, D. Crenshaw Survey, southeast of Jacksboro in Jack County, is setting 5½-in. casing at 4,681 ft. for completion attempt in the Caddo lime. No. 1 Sewell topped the Caddo section at 4,676 ft. and drilled lime with oil show from that depth to 4,685 ft. Bailer recovered some free oil at 4,685 ft. and in drilling deeper to 4,693 ft., total depth, found additional recovery. No estimate was made on the recovery of the test, which is being drilled with cable tools.

Foard County Wildcat Testing

In Foard County, Bruce Sullivan 1 McCoy, Seaton Survey, gave little indication that it might open a new Bend conglomerate pool 4 miles south of Cowell as continued swabbing after acid treatment resulted in only slight oil recovery. The test was treated with 1,000 gal. of acid at 5,592-5,600 ft. Operator swabbed 8 hours, making 6 bbl. of fluid the first hour and then declining to practically nothing. The fluid was 25 per cent 37-gravity oil and 75 per cent mud and acid water.

Shallow Pool Extended

The shallow Howsley-McCord pool in the southern part of Throckmorton County was given a ¼-mile north extension with the completion of M. A. Grisham 1 Kelly. No. 1 Kelly was completed on the pump for 39 bbl. of oil daily from sand at 735-50 ft. Location is in the southeast part of Comanche Indian Survey 27.

Grayson County Show

Sinclair Prairie 1 Wheeler, C. Quillen Survey, Grayson County wildcat southwest of Collinsville, was drilling ahead below 3,342 ft., at last report, after finding a slight show of asphaltic oil at 3,412-22 ft. On a 30-minute drill-stem test, 1 Wheeler recovered 27 ft. of asphaltic oil and 250 ft. of salt water.

NEW WILDCAT LOCATIONS

Clay County: Bridwell Oil Co. 17 H. C. Edrington, 2,000 ft. from W and 4,000 ft. from S lines Sec. 37, H.&T.B. Sur. A-229, 1,700-ft. rotary test.

Continental Oil Co. 3 E. Spring, 33 ft. from S and 2,518 ft. from E lines Sec. 23, H.&T.C. Sur. A-247, 6,500-ft. rotary test.

Montague County: Lesh & McCall 1 M. J. Reed, 750 ft. from S and E lines M. J. Reed 234.4-ac. tract in M. J. Skeen Sur., A-717, 5,500-ft. rotary test.

Wilbarger County: Consolidated Oil Co. 1 A. D. Potts, 3,300 ft. from S and E lines Sec. 4, Blk. 7, H.& T.C. Sur., 4,500-ft. rotary test.

NORTH TEXAS COMPLETIONS

Wildcats

Clay County: Bridwell Oil Co. 3 C. T. Taylor, B.B.B.&C. Sur., A-1048, dry at 1,608 ft.

J. M. Seaberry and H. B. Duncan 1 Glenn Tucker, C. F. Stanley Sur., A-407, dry at 1,471 ft.

Denton County: Hunt Oil Co. 1 T. J. Jones, J. Thomas Sur., A-1239, dry at 5,633 ft.

Jack County: Roeser & Pendleton 1 W. J. Webb, J. E. Middleton Sur., A-2125, 71 bbl. in 24 hr., 63/64-in. choke, pay 2,882-2,933 ft.

Wichita County: Fresno Oil Co. 1 Fredia Wieman, Sec. 213, Waggoner Colony subd., dry at 2,697 ft.

Fields

Baylor, Baylor County: British American Oil Co. 4-A Claude Cowden, Sec. 115, T.&N.O. Sur., A-351, dry at 2,570 ft., top Canyon 2,539 ft.

Hull Silk, Archer County: J. A. Chapman 6-F L. F. Wilson, Sec. 22, Lot 5, A.T.N.C.L. Sur., 126 bbl. in 3 hr., ¾-in. choke, est. 450 bbl., 3,000 gal. acid 3,958-80 ft.

Jack, Jack County: Hanlon-Buchanan 1 Mary Hoefle, A. James Sur., A-318, 672 bbl. in 24 hr., 18/64-in. choke, top Caddo 4,867 ft., 2,000 gal. acid 4,867-4,906 ft.

Hanlon-Buchanan 2 F. M. Myers, F. N. Rudmose Sur., A-1803, 125 bbl. in 24 hr., pay 2,437-42 ft.

K.M.A., Wichita County: Hanlon-Buchanan 7-A S. L. Denny, Sec. 27, Cowherd Browns subd., dry at 879 ft.

Lincoln & Moore 8 R. J. Bradley, S. Holloway Sur., A-497, dry at 1,833 ft.

E-C Oil Co. 26 Anna Mangold, Sec. 37, Castleberry Sur., A-35, 202 bbl. in 3 hr., ¾-in. choke, est. 750 bbl., 3,000 gal. acid 3,780-4,370 ft.

Venmex Oil Co. 6 Big Wichita River Bed, Wichita River Bed Sur., 90 bbl. in 3 hr., ¾-in. choke, est. 375 bbl., top Ellenburger 4,317 ft., pay 3,752-4,359 ft.

Petrolia, Clay County: Darby Lynde 1-S J. D. Stine, Sec. 7, Parker C.S.L. Sur., A-374, dry at 211 ft.

Wynn, Clay County: L. T. Burns 4 C. L. Wynn, Sec. 34, Hiram Williams Sur., A-704, 207 bbl. in 3 hr., ¾-in. choke, est. 900 bbl., top Caddo 5,380 ft., top Ellenburger 6,165 ft., top Chappel lime 5,878 ft., pay 6,088-94 ft.

Miscellaneous Fields

Archer County: Hanlon-Buchanan 1 Ewing Clagett, Rachel Story Sur., A-373, dry at 1,480 ft., top Gunsight 1,375 ft.

Wichita County: Hanlon-Buchanan 33-E Fassett & Tuttle, Sec. 4, S.A.&M.G. Sur., A-582, 55 bbl. in 3 hr., ¾-in. choke, est. 190 bbl., top K.M.A. 3,888 ft., 180-qt. shot 4,021-60 ft., T.D. 4,061 ft.

NEW WILDCAT LOCATIONS

Jones County: Percy Jones 1 Nana D. Newton, J. Halfpenny Sur. 139, 2,250-ft. cable-tool test.

Hendrickson Milner 1 J. C. Huddleston, 660 ft. from N and 150 ft. from W lines Sec. 2, Lot 34, T.&P. Sur., Blk. 20, 2,500 ft. cable-tool test.

Parker County: B. B. Bryson 1 J. S. C. DeBusk, 330 ft. from E and 990 ft. from S lines of 80-ac. tract, Sec. 349, T.&P. Sur., 1½ mi. S of White.

New Pool Is Opened In Shackelford County

FORT WORTH, Tex.—A new oil-producing area was opened this week in Shackelford County with the completion of Kleiner & Heltzel 1-A Dawson. No. 1 Dawson was completed in the Tannehill sand at 1,427-41 ft. to pump 65 bbl. of oil daily. Location is in the SE SE SW Section 165, E. T. Survey, east of Cook Ranch production and about 12 miles northwest of Albany.

Wimberly Pool Extended

A slightly west extension for the Wimberly pool in Jones County was recorded with Fain & McGaha Oil Co. 1 Trapley, Block 104, De Witt C.S.L. Survey, flowing an estimated 176 bbl. of oil in 2½ hours. The test extended the pool ⅛ mile to the west. Production was found in a 6-ft. pay section in the area's 2,500-ft. horizon.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Comanche County (semiwildcat): O. L. Johnson 1 J. E. Hodge, Sec. 11, H.&T.C. Sur., Blk. 2, 20 bbl. in 24 hr., pumping, 120-qt. shot 2,465-2,727 ft.

C. D. Lane 1 W. T. Hazzard, Marmaduke Hatton Sur., A-424, dry at 3,105 ft.

A. H. Woodfin 1 W. A. Pettit, E. Tatum Sur., A-938, dry at 3,276 ft., top Ellenburger 3,251 ft.

Eastland County: Stewart Oil Co. 1 O. Shaeffer, Moses Allen Sur. 26, dry at 3,792 ft., top Ellenburger 3,730 ft.

Jones County: O'Donahoe Oil Co. 1 C. M. Morrison, David T. Bruce Sur. 135, dry at 2,515 ft.

Shackelford County: R. H. Roark 1-B J. H. Elliott, Sec. 9, L.A.L. Sur., 107 bbl. oil and 10 bbl. water in 24 hr., 7/64-in. choke, 100-qt. shot 2,912-40 ft., top Caddo 3,872 ft., top Ellenburger 4,355 ft., T.D. 4,395 ft.

Fields

Albany, Shackelford County: C. B. Christie 4 W. D. Reynolds, Sec. 24, T.&P. Sur., Blk. 11, 4 bbl. in 24 hr., pay 1,253-57 ft.

Loving, Stephens County: Knight & Ewing 1 J. H. McKelvin, Sec. 11, O.A.L. Sur., 15 bbl. in 24 hr., 1,500 gal. acid 3,492-3,515 ft., top Caddo 3,492 ft., T.D. 3,530 ft.

Merkel, Taylor County: Staley Oil Co. 2 B. Morgan, Lot 8, Grimes C.S.L. Sur. 124, dry at 2,808 ft.

Novice, Coleman County: States Oil Corp. 2 V. N. Owen, Sec. 23, T.&N.O. Sur., Blk. 2, 127 bbl. in 24 hr., pay 3,600-30 ft., T.D. 3,635 ft.

Sayles, Jones County: F. K. Johnson, Ungren & Frazier 10 Henry Sayles, Sec. 6, T.&P. Sur., Blk. 20, dry at 2,065 ft.

TEXAS GULF COAST

Eight New Wildcats Staked; Two Outposts Are Showing

By NEIL WILLIAMS

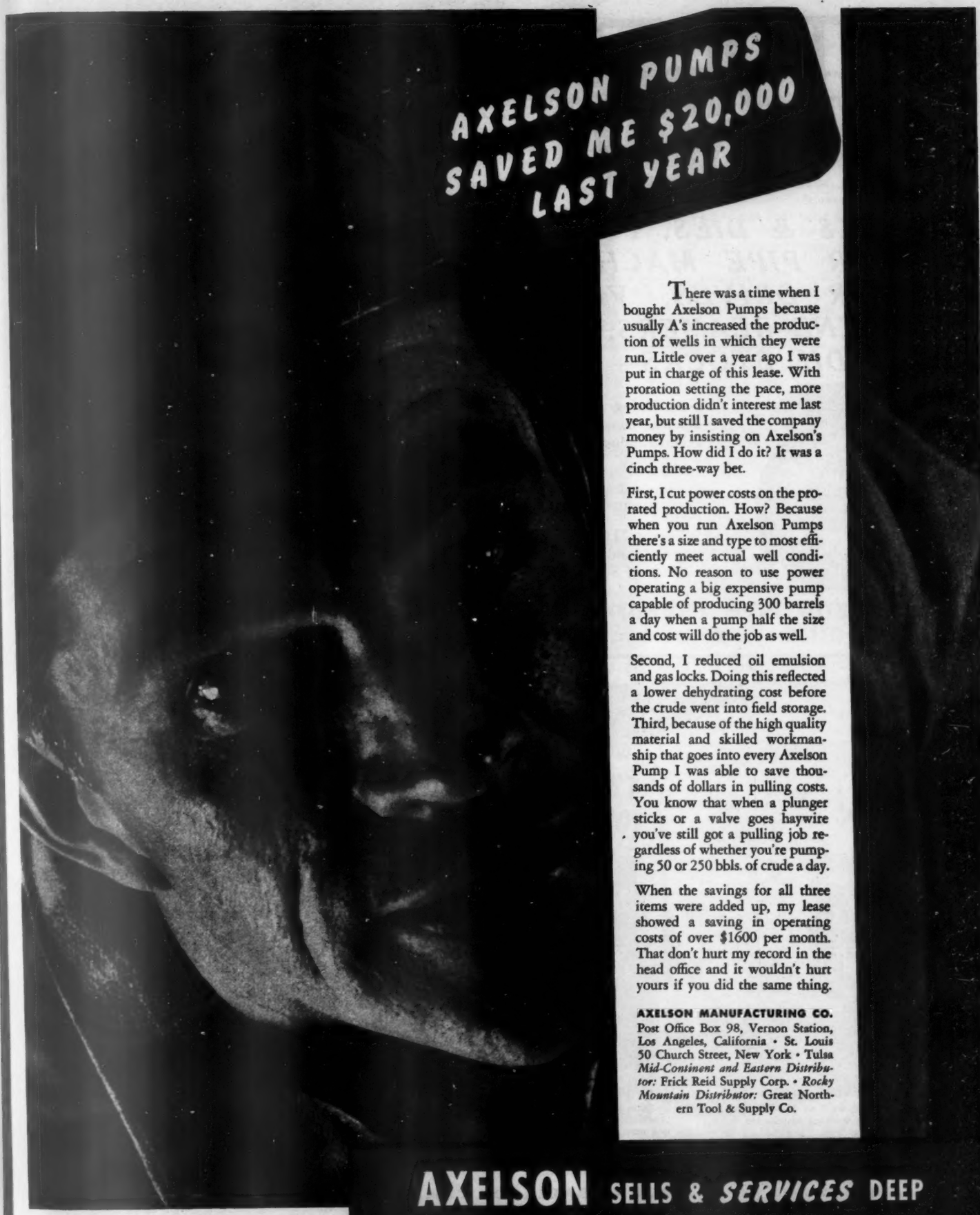
HOUSTON, Tex.—An attempted blowout of a wildcat in Harris County, testing of a semi-wildcat in the Kubela area, Wharton County, and the starting of eight new wildcat operations were the highlights of development along the Texas Gulf Coast district the past week.

Atlantic 1 A. B. Cohn, located in the Crosby area, in the M. Duncan Survey, Harris County, was being watched with much interest as it drilled ahead below 8,565 ft., after an attempted blowout at 8,521 ft. The Cockfield was topped at 7,795-7,819 ft., Discorbis Yeguaensis at 7,889-7,904 ft., and the Eponides Yeguaensis at 8,035-50 ft. The well is located just east of the Esperson dome in Liberty County.

Sinclair Prairie 1 Kubela, east of the Kubela area in the E.T.R.R. Survey 79 was drilled to a total depth of 7,615 ft., and 5½-in. casing was being cemented at approximately 5,325 ft., preparatory to testing from 5,200-25 ft., where sidewall cores are reported to have shown favorable indications. This is the second test to be drilled in the area by the company.

Mercy Discovery

A potential gage on the Shell Oil Co., Inc., recent Wilcox sand discovery in the Mercy area, San Jacinto County, marks it as one of the most important discoveries to be found along the trend. The well was tested for 24 hours through a ¼-in. choke and it gaged 583 bbl. of 38-gravity oil daily with tubing pressure 860 lb. and casing pressure



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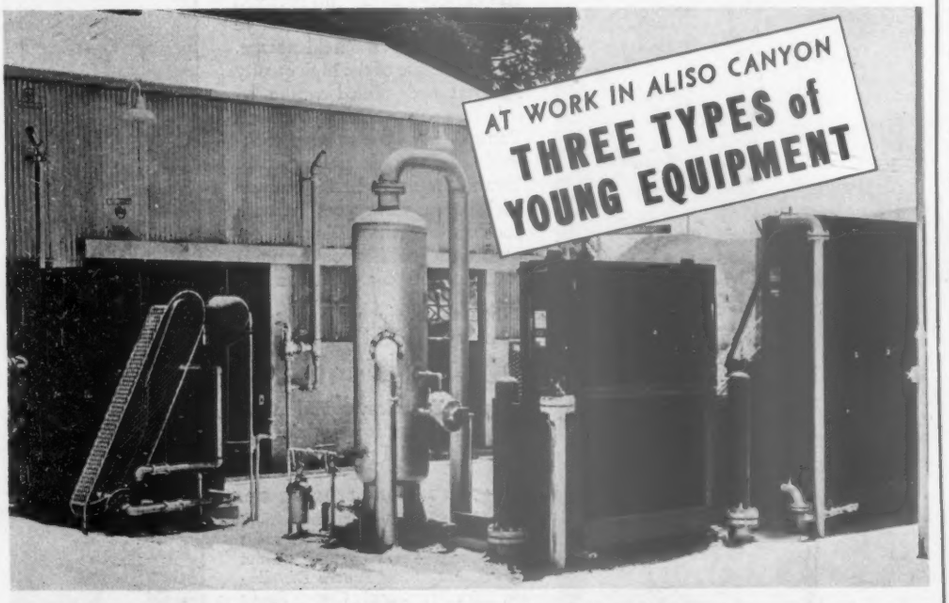

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1,620 lb. Gas-oil ratio was 771 : 1. Total depth of the well is 8,321 ft., and production is through perforated casing opposite sand at 8,273-79 ft. No new locations were made in the area the past week.

New Distillate Well

Gas-distillate production in the Lake Creek field, Montgomery County, was being extended several hundred feet to the southeast by Superior Oil Co. of California 1 South Texas Development Co. On a drill-stem test through perforated casing at 9,765-75 ft., the well flowed gas and distillate, and at the end of the week these perforations had been squeezed and another sand at 10,140-50 ft. was being tested. The same company's 1-D McWhorter, another outpost, was running 7-in. casing after drilling to a total depth of 10,360 ft.

Ramers Island Discovery

American Republics and Houston Oil Co. continue to have trouble in completing 2 Cushing, a prospective Cockfield sand pool opener located in the Ramers Island area, Tyler County. On a drill-stem test through perforated casing at 5,390-92 ft., the well flowed oil and wash water for 5 minutes, but before the well could clean itself, gas broke in, and the tubing pressure built up 1,800 lb. in 15 minutes. At the end of the week the company was attempting to squeeze off the gas sand and will retest in the sand section at 5,390-5,406 ft., where drill-stem testing recovered several hundred feet of pipe-line oil.

New Wildcats Started

While field operations continued to be curtailed, wildcatting activity was showing an increase as eight locations were announced. This is the largest number of wildcats to be announced for the district in several months. They are:

Austin County: Humble 1 H. Miller, 9,500-ft. Wilcox test, 10 miles northwest of New Ulm in the Wm. Allen Sur.

Fort Bend County: Circle Oil Co. 1 Sugarland Industries, northwest flank Sugarland field, Wm. Stafford Survey.

Prespect Drilling Co. 1 A. E. Holmes, southwest of Clodine, S. Isaacs Sur.

Grimes County: Magnolia 1 Brigance, R. Ray Sur., north of the town of Navasota, 6,800-ft. Wilcox test.

Harris County: George Strake 1 Phoenix Dairy, 15 miles north of Houston, Peter Craft Sur.

Pure 1 Mike Albanese, northeast of Alief, Williams Sur.

Jackson County: Rowan & Hope 1 Simmons, 2 miles east of Edna in W. J. E. Heard Sur.

Matagorda County Pure Oil Co. et al 1 Sam B. LeTulle, 6,000-ft. test in the George Wheelright Sur., Collegepoint area.

TEXAS GULF COAST COMPLETIONS

Wildcats

Jackson County: S. W. Richardson 1 Fenner, dry, T.D. 6,025 ft.

Houston County: O. W. Killam 1 Houston County Coal Co., dry, T.D. 3,416 ft.

Fields

Ariola, Hardin County: Houston Oil Co. 17 Ariola, T.D. 3,796 ft., completed as salt-water disposal well.

Dickinson, Galveston County: Pan American 1 R. B. Peters, 18,250,000 cu. ft. gas, open flow, T.D. 8,880 ft.

Hull, Liberty County: Houston 1 Heimple, 410 bbl., 11/64-in. choke, T.D. 6,788 ft.

Republic 75 Dolbear, dry, T.D. 2,287 ft.

Republic 157 Dolbear, old well, 120 bbl., pumping, perf. casing 1,990-2,010 ft., T.D. 2,662 ft.

Lolita, Jackson County: Cox & Hamon 2 Mitchell, 102 bbl., ¼-in. choke, perf. casing 5,297-95 ft., T.D. 5,960 ft.

Lovells Lake, Jefferson County: Humble 25 Jefferson Land Co., 141 bbl., ⅛-in. choke, perf. casing 7,716-34 ft., T.D. 7,734 ft.

Martha, Liberty County: Stanolind 1-C Seaberg, top Cockfield 8,122 ft., Discorbis Yeguaensis 8,130 ft., Epcnides Yeguaensis 8,364 ft., dry, T.D. 9,000 ft.

North La Ward, Jackson County: Humble 4 Four Way Ranch, 528 bbl., ¼-in. choke, top sand 5,206 ft., T.D. 5,213 ft.

Port Neches, Orange County: Texas 16 Stark, 75 bbl., ¼-in. choke, perf. casing 3,082-95 ft., T.D. 3,105 ft.

Red Fish, Chambers County: Humble 299-248 State, 187 bbl., ¼-in. choke, perf. casing 9,328-32 ft., T.D. 9,355 ft.

OKLAHOMA FIELD REPORT

Interpretation of M-68 Sought For Two Typical Exceptions

By ROBERT INGRAM

ONLY about half the usual number of wells were drilling in Oklahoma last week. Even wildcat activity was slowed by spacing requirements of Conservation Order M-68. Peculiar conditions surrounding nearly every pool called for a special interpretation of the order and no such interpretation was forthcoming. At the same time, operators hesitated to drill wildcats until they knew more about how they could develop any discoveries they made.

Operators were particularly hard hit in the eastern areas where most of the drilling in recent years has been on small structures or "pimples." In many cases it was impossible to develop these "pimples" on a uniform 40-acre spacing pattern. Other local conditions created problems and at least two test cases were being made to get an interpretation.

One operator located a well in Osage County on a small local high which would immediately call for an exception. The location he chose was on a 40-acre unit, but did not fall in the same spot in the unit as an earlier well. However, it was reasonably certain that the location he chose would be a far better well than one on a uniform pattern, and he had approval of his choice. To find out what he could do, the operator made the location he wanted, then filed application for exception with OPC.

A similar, and perhaps more far-reaching test, was made by Atlantic Refining Co. at 2 Nesbitt, NW NW NW 27-9-4, in West Hotulke area. This well was staked on the same 40-acre unit as the 1 Nesbitt, a Wilcox sand producer. Although it was located before December 23 when M-68 was announced, it was not spudded until after that date.

However, because the operators planned to complete the 2 Nesbitt in the Viola and not the Wilcox, they proceeded with operations. They attempted to make a test of the Wilcox before preparing to complete, but had mechanical difficulties. Then they shut the well down and filed application for exception.

General belief was that M-68 meant one well to each 40 surface acres, regardless of the source of supply. If this interpretation became official, Atlantic obviously would have to have an exception to complete the well, which was reported to have indicated 400 bbl. a day production from the Viola. It would also raise the question of whether multiple-zone completions would be permitted in such areas as had more than one producing zone.

Pure Oil Co. had a similar situation in its Cumberland pool in Marshall County where at least two rigs were shut down because of spacing. Both the McLish and the bromide are producing at Cumberland, and soon after the 40-acre rule was announced, Pure obtained an order from the Corporation Commission permitting development on a plan of one well to each 40 acres on each common source of supply. This would permit one well to each 20 surface acres. Pending further interpretation of the federal order, however, Pure continued drilling only at such wells as were spotted one to each 40 surface acres.

Another new area in which development had been halted was in Creek County, south of the Big Pond field, recently opened by D. B. Malernee. Mid-Continent Petroleum 2 Bear, SW NE SE 3-14-7, offset, was staked and shut down.

Panhandle Test Dry

Gulf Oil Corp. 1 Julius Cox, SE SE 35-2n-8ecm, a wildcat in Cimarron County, Oklahoma Panhandle, was a dry hole last week at a total depth of 6,165 ft. The Arbuckle was topped at 5,995 ft. Reports persisted in Boise City that another test would be drilled this summer, probably in view of the large blocks of leases assembled.

Wildcatting Continues in New Areas

What wildcatting was under way last week was largely in the southern and western parts of the state where the play is still in the wide-open spaces. The deep McLish sand zone was being sought by two wildcats getting under way in Marshall County. First of these to start was Colbert Marshall and Edward J. Kubat 1 McCormick, SE SE SE 4-6s-6e, between Madill and Aylesworth. At last report the well was drilling below 900 ft. after setting surface pipe.

Due to start by March 15 was M. A. Neff and Roy A. Godfrey 1 Neff-Godfrey, NE NE SW 13-6s-6e, just west of Aylesworth. This test is on a block which has been worked and reworked by geophysical crews and it is supported by Ame-

(Continued on Page 71)

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Bottom Hole Information

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APPALACHIAN FIELDS

Chestnut Ridge Test Finds Gas in Helderberg Lime

PITTSBURGH, Pa.—Interesting highlights in Southwest Pennsylvania were reported which includes a large gas well on Chestnut Ridge, salt water in the Oriskany in Beaver County, a new deep test starting in Lawrence County, and the top of the Onondaga in a deep test in Greene County. In West Virginia there is an added extension to the Big lime oil lens in Kanawha County and a good Oriskany gas well in Jackson County. In Ohio there was a fair oil well in Perry County.

SOUTHWEST PENNSYLVANIA

On Chestnut Ridge in South Union Township, Fayette County, Peoples Natural Gas Co. in cleaning out 1 Piedmont Coal Co., which had been drilled by a rotary and bottomed in the Helderberg at 6,825 ft., deepened it and at 6,844 ft. struck an additional pay of 1,000,000 cu. ft. of gas. At 6,845 ft. the volume increased to 10,000,000 cu. ft., making it the largest well on the structure, and the gas was turned into the line. It has held up well the first few days. In a drill-stem test, when originally drilled with the rotary, it had a gage of over 5,000,000 cu. ft., which was not entirely recovered when the well was cased but had an open flow of about 3,500,000 cu. ft. This well appears to be the first producing from the Helderberg, although 3 Piedmont Coal struck its best volume at a considerable depth below the top of the Oriskany sand.

In Lawrence County, John T. Galey et al are building a rig for a deep test to the Oriskany sand on the Miller and Myers lease in Slippery Rock Township. It is about 1¼ miles due south of the Carnegie Natural 1 Heickel, which found the Oriskany hard and unproductive, and about 1 mile due north of the town of Energy.

In Beaver County, the test of the St. Joseph Lead Co. on the J. P. Koehler heirs farm in Center Township topped the Oriskany sand at 5,312 ft., and at 5,325 ft. salt water broke in and it was abandoned. The Onondaga was topped at 5,140 ft. It was not on a pronounced surface structure but was located by seismograph.

In Greene County, Natural Gas Co. of West Virginia topped the Onondaga lime at 6,757 ft., cable measurement, in the wildcat on the Andrew Workman farm on the west flank of the Washington anticline in Richhill Township. This is the first test to that member in Greene County and is now drilling at 6,768 ft., and when the chert is struck the hole will be cased.

In Maryland, William E. Snee et al have made a new location for a second test on the Accident dome in Garrett County which is located on the George Georg farm about 1,500 ft. north, 55° west of the test on the Schartzer farm (Humberson) which found the Oriskany sand dry, total depth 8,163 ft. The extreme depth of the first test was believed due to ending on the downthrow side of a fault, as surface work indicated about 6,700 ft. to the lower Devonian.

Armstrong County, Burrell Township: T. E. Rosenstell & Son 1 J. A. Beck, deepened, 20,000 cu. ft. gas, Fourth and Fifth sands, T.D. 1,922 ft.

Cowanshannock Township: Local Co. 1 Mary Umbaugh, 26,000 cu. ft. gas, Bradford sand, T.D. 3,192 ft.

Plum Creek Township: T. W. Phillips 3 J. P. Dunmire, 48,000 cu. ft. gas, Hundred-foot sand 1,349-1,477 ft., gas 1,392 ft., through Bradford sand, T.D. 3,470 ft.

Clarion County: Porter Township: Sedgewick & Crumb 1 William Willison, 65,000 cu. ft. gas, Sheffield sand, T.D. 2,728 ft.

Fayette County, Nicholson Township: Greensboro Gas Co. 1 American Coke & Fuel Co., 4,424,000 cu. ft. gas, Big Injun sand 1,197 ft., gas 1,262-70 ft., gas 1,272-73 ft., T.D. 1,377 ft.

Greene County, Monongahela Township: Pittsburgh Steel Co. 2 fee, 2,500,000 cu. ft. gas, Big Injun sand 1,411 ft., gas 1,540-46 ft., T.D. 1,550 ft.

Wayne Township: H. D. Freeland et al 1 J. F. Kent heirs, 2,500,000 cu. ft. gas, Fourth sand 2,935 ft., gas 2,948-52 ft., T.D. 2,952 ft.

Washington County, Morris Township: Union Gasoline & Oil Corp. 1 S. L. Day, 350,000 cu. ft. gas., Nineveh Thirty-foot sand 2,760 ft., gas 2,766 ft., T.D. 2,783 ft.

South Franklin Township: Foley & Williams 1 Martha Johnson, 230,000 cu. ft. gas, Little Dunkard 877 ft., gas 884 ft., T.D. 926 ft.

Westmoreland County, Bell Township: Peoples Natural Gas Co. 1 Westmoreland Mining Co., 38,000 cu. ft. gas, Murraysville, Hundred-foot and Tiona sands, T.D. 3,900 ft., R.P. 405 lb.

WEST VIRGINIA

In Kanawha County, South Penn Natural Gas Co. is completing 3 Ray-Salyers in Poca district, which is showing considerable oil in the Big lime and which may extend production, as it is about 1,650 ft. due south of 2 H. C. Jones. On the east of the H. C. Jones farm on which five oil wells still have a total daily potential of over 500 bbl. a day from the Big lime, Virginian Gasoline & Oil Co. completed 2 J. A. Wines in the Big lime and it is showing for about 15 bbl. a day. The Maxton sand was 1,322-1,413 ft., Little lime 1,420-58 ft., Pencil Cave 1,458-60 ft., Big lime 1,460-1,572 ft., gas 1,531 ft. and 1,550 ft. (500,000 cu. ft. initial), break in lime 1,534-36 ft., oil show 1,534-36 ft., oil 1,567-69 ft., T.D. 1,572 ft.

Boone County, Scott district: Owens, Libby-Owens 2 L. F. Echols heirs, 99,000 cu. ft. gas, Big lime 1,744-1,926 ft., brown shale 2,423-41 ft., T.D. 2,471 ft.

Calhoun County, Sheridan district: B. J. Crawley et al 3 M. M. Snyder, 40 bbl., Big Dunkard 1,047-72 ft., Salt sand 1,640-1,704 ft., Maxton 1,720-1,820 ft., Little lime 1,828-48 ft., Pencil Cave 1,848-54 ft., Big lime 1,854-1,940 ft., Big Injun 1,940-2,006 ft., gas shows 1,330, 1,970 and 1,980 ft., oil 1,980-2,006 ft., T.D. 2,023 ft., shot 1,976-2,006 ft.

Center district: Hope 8591 Lee Gainer, 2,475,000 cu. ft. gas, sand 1,569-1,635 ft., Salt sand 1,670-83 ft., gas shows 1,591 ft. and 1,605 ft., gas 1,682 ft., T.D. 1,683 ft.

Sherman district: V. W. Hamilton et al 5 T. S. Cunningham, 15 bbl., Injun sand, T.D. 2,220 ft.

Virginian Gasoline & Oil Corp. 7 Arminda Elliott, 12 bbl., Injun sand, T. D. 2,110 ft.

Creed Yoak and H. S. Brown 2 Edith McDonald, 25 bbl., Injun sand, T.D. 1,965 ft.

McCall Drilling Co. 3 Lee Gainer and Lillie Wigner, 273,000 cu. ft. gas, Big lime 2,002-52 ft., Injun 2,052-2,156 ft., oil show 2,151-53 ft., gas 2,099-2,151 ft., T.D. 2,158.

Gilmer County, Glenville district: W. H. and L. E. Mossor 1 Maggie Edwards, gas exhausted, will abandon; Big lime 1,865-1,925 ft., Injun 1,925-2,048 ft., Squaw 2,048-84 ft., Berea 2,325-40 ft. Had a gage of 267,000 cu. ft. gas.

Kanawha County, Poca district: South Penn 4 G. W. Burdette, dry, through Big lime, T.D. 1,704 ft.

Lincoln County, Jefferson district: Hamlin Gas Co. 1 J. Miller, drilled deeper, from 2,351 ft., 33,330 cu. ft. gas, brown shale 3,440-3,790 ft., T.D. 3,800 ft.

Ritchie County, Murphy district: Hope 8588 J. W. Gorrell, 31,863 cu. ft. gas, Maxton sand 1,874-95 ft., Injun sand 2,045 ft., T.D. 2,153 ft.

Hope 8589 B. B. Nestor, 582.000 cu. ft. gas, Maxton sand 1,764-77 ft., T.D. 1,782 ft.

Wetzel County, Grant district: South Penn Natural Gas Co. 34 J. B. Dewhurst, dry, through Fourth sand, T.D. 3,103 ft.

Wirt County, Burning Springs district: Glen W. Roberts 11 W. C. McConaughey, dry, Injun sand, T.D. 1,749 ft.

ORISKANY GAS FIELDS

Jackson County, Ravenswood district: United Fuel Gas Co. 5070 R. C. Hutchinson, 12,327,000 cu. ft. gas, Corniferous 4,998 ft., Oriskany 5,110 ft., R.P. 1,500 lb., T.D. 5,181 ft.

Ripley district: United Carbon Co. 994 Elizabeth W. Perkins, 5,406,000 cu. ft. gas, Corniferous 5,044 ft., Oriskany 5,146 ft., shot 5,147-75 ft., R.P. 1,795 lb., T.D. 5,191 ft.

United Carbon Co. 1002 W. F. Roush, 5,406,000 cu. ft. gas, Corniferous 4,824 ft., Oriskany 4,935 ft., shot 4,935-51 ft., R.P. 1,650 lb. T.D. 4,976 ft.

Joe Rubin 1 U. G. Weekley (reported U. G. Weekley should have read Mike Archer and good for 7,979,000 cu. ft. gas as reported. No. 1 U. G. Weekley being completed now with Corniferous 4,865 ft., Oriskany 4,985 ft., gaging 20,000 cu. ft. gas only at 5,980 ft. before shot.

Kanawha County, Poca district: Godfrey L. Cabot, Inc. 27 Putnam Co., 622,000 cu. ft. gas; Corniferous 4,980 ft., Oriskany 5,063 ft., shot 5,066-5,102 ft., R.P. 1,225 lb., T.D. 5,146 ft.

INDIANA, OHIO, KENTUCKY

Two Pool Openers Are Completed In Indiana

EVANSVILLE, Ind.—The past week was the most successful one so far this year for Indiana operators as the completion of two pool openers and the testing of another prospective pool opener highlighted oil-field exploration in the state. The prospective pool opener was the Sells Petroleum Co. 1 McCarty, NE SE NW 32-6s-11w, in Vanderburg County about 2 miles southwest of Evansville, where operators recovered 1,200 ft. of free oil with some drilling mud and water on a drill-stem test of the Waltersburg sand. No. 1 McCarty is about 2 miles west and south of nearest production in the Heusler Dome field. If the well is successfully completed it will be the nearest producer to Evansville.

Pools Opened in Gibson and Spencer

A wildcat in the eastern part of Spencer County, about 2 miles from other production, was completed last week as a small producer in a sand horizon at 1,008-26 ft. It is R. Hal Compton 1 J. A. Stewart, NW SW SW 27-6s-5w. The well was given an 80-qt. shot and produced about 20 bbl. of oil and some water initially.

Mo-Jo Oil Co. 1 Revis Dugan, SE SE NW 35-2s-9w, a pool opener in Gibson County, has been completed on pump with an initial of about 20 bbl. daily from the Mansfield sand at 1,066-74 ft.

OHIO

NEWARK, Ohio.—A wildcat test on the Cambridge anticline in northern Washington County is approaching the Oriskany horizon. Columbian Carbon Co. 1 Charles Augenstein, Lot 49, Adams Township, topped the lime at 4,258 ft. and is drilling head at 4,318 ft. in a 6⅝-in. hole. The Oriskany is expected about 140 ft. in the lime. An 8-in. hole was carried to the top of the lime. Elevation of the test is 802.3 ft.

The oil pool east of Thornville, Perry County, yields a 220-bbl. producer, increasing the prospects for eastward extension.

A gasser gaging 4,000,000 cu. ft. open flow was completed southwest of the old Crooksville oil pool in Perry County.

OHIO COMPLETIONS

Ashland County, Lake Township: Glen Harmon 1 J. F. Anderson, Sec. 3, 1,150,000 cu. ft. gas, shot, Clinton, T.D. 2,818 ft.

Vermillion Township: Stewart et al 1 G. W. Long, Sec. 17, 400,000 cu. ft. gas, shot, Clinton, T.D. 2,825 ft.

Knox County, Brown Township: Upham Gas 1 D. Lifer, Sec. 23, 80,000 cu. ft. gas, Clinton 2,679-82 ft., T.D. 2,736 ft.

Butler Township: Knox Exploration Co. 2 W. H. Fry heirs, Lot 6, dry, through Clinton sand, T.D. 3,107 ft.

Clay Township: W. I. Booth 1 Hugh L. Cooksey, Sec. 16, 35,000 cu. ft. gas, Berea, top sand 751 ft., T.D. 757 ft.

Union Township: Knox Exploration Co. 2 Manning Cline, Sec. 22, dry, Clinton sand, T.D. 2,969 ft.

Upham Gas 1 M. Cline, Sec. 21, dry, Clinton 2,892-2,908 ft., T.D. 2,969 ft.

Gail Early et al 1 H. C. Hammon, Sec. 22, 60,000 cu. ft. gas, Berea, T.D. 760 ft.

Licking County, Mary Ann Township: Ohio Fuel 1 Edw. O. Heller, Sec. 5, dry, Clinton 2,554-71 ft., T.D. 2,624 ft.

Meigs County, Salem Township: Downie et al 1 E. Gorley, Sec. 2, dry, Maxon (water), T.D. 800 ft.

Morgan County, York Township: Industrial Gas 1

(Continued on Page 71)

SOUTHWEST TEXAS

Crude Production Found on Flank of Sejita Structure

By F. L. SINGLETON

CORPUS CHRISTI, Tex.—Crude production was being opened on another gas-distillate structure in the Southwest Texas district as Trinity Gas Corp. 1 Adolfo Garcia, located on the west flank of the Sejita structure, Duval County, recovered 2,200 ft. of 43-gravity oil through a ¼-in. choke. The test was made after topping the sand section in the Cockfield at 5,780 ft. This field was opened in 1939 by Standard Oil Co. of Texas with the completion of 1 Jack Casey. Total depth of this well is 6,747 ft., and a series of sands at intervals from 5,300-6,600 ft., tested gas or distillate. Development of the structure was resumed in 1940 in conjunction with a recycling plant that is being built in the field by the Trinity Gas Corp.

Test at Seeligson

Another major extension was assured the Seeligson field, Jim Wells County, as Shell Oil Co., Inc., prepared to test 1 Seeligson, about 4,500 ft. southwest of production. Total depth of the well is 6,020 ft., and 5½-in. casing was cemented at 5,965 ft. after a 10-minute drill-stem test at 5,983-93 ft., recovered 900 ft. of 40.2-gravity oil and tested 130 lb. working pressure. Correlated with other producers in the field, 1 Seeligson is about normal and is assured of production in other sands, as drill-stem testing at intervals from 5,200 ft. to the total depth, recovered oil and gas. An east offset to the well has been started by Sun Oil Co.

Practically all wells drilled on the structure to date have been drilled on 40-acre units, and the completion of the Shell producer would extend production in a southwesterly direction for a distance of approximately 6 miles. North of the Shell well, Transwestern 1-A Seeligson, Willis Millican Survey 335, is running a potential test after flowing 37 bbl. in 10 hr., through a 5/64-in. choke from perforated casing at 5,950-55 ft.

Wildcat Near Orange Grove

In the same county, but located 2 miles southeast of the Orange Grove townsite, Plymouth 1 J. J. Kuck was tested through perforated casing at 3,672-91 ft., and the well tested 475 lb. working pressure and recovered 270 ft. of gas-cut mud on a 1-hour and 45-minute drill-stem test. The perforations were squeezed off and the well will be retested in the lower part of the sand.

Carrizo Sand Showing

Phillips 1 Victor L. Strunk, 3½ miles southeast of Kenedy, Karnes County, was holding much attention as the company prepared to test through perforated casing at 6,236-49 ft. This well was drilled to the Wilcox at 8,514 ft., and 5½-in. casing was cemented at 6,399 ft. after an electrical survey showed favorable indications. On a 20-minute drill-stem test earlier in the week at 6,336-43 ft., the well tested 6 lb. working pressure and recovered 1,800 ft. of fluid, of which 20 per cent was oil and the balance salt water. The sand section is believed to be in the Carrizo formation.

The outcome of the above test is being watched with wide interest in view of T. B. Slick, Jr., 1 Grissom, south of the Caesar field, Bee County, which was recompleted in the Carrizo sand bottomed at 6,560 ft., for an initial production of 8 bbl. of 40.7-gravity oil per hour through a ⅛-in. choke. Tubing pressure was 1,100 lb., and casing pressure 1,150 lb.

Second Well at McLean

Approximately 1,300 ft. northwest of the discovery well of the new McLean field, Webb County, O. W. Killam 2 Marrs McLean was being retested, after mud and oil was swabbed through perforated casing at 3,218-26 ft. Total depth of the well is 3,279 ft., with 5½-in. casing cemented at 3,259 ft. Correlated with the operator's 1 McLean, the discovery well, it is structurally higher.

In the Balcones fault line district, and 1 mile southwest of the Pearsall field, Frio County, Weigand Brothers 1 J. T. Gilliam, B.S.&F. Survey, is bottomed in chalk at 5,375 ft., and 5½-in. casing was set at 4,836 ft., preparatory to testing a crevice in the Taylor marl at 4,875 ft., which is reported to have showed considerable oil in the pits. Top of the chalk was 5,200 ft. Main production in the field heretofore has been from the Navarro sand and Austin chalk.

In Bastrop County H. A. Pagenkopf was attempting to open Edwards lime production as preparations were made to test 1 Ella Bell, located in the A. Black Survey. Total depth is 3,150 ft., with 7-in. casing cemented at 3,102 ft.

SOUTHWEST TEXAS DISTRICT COMPLETIONS

LOWER GULF COAST DISTRICT

Wildcats

Calhoun County: Rowan & Hope 2 Wilson, dry, T.D. 6,007 ft.

Jim Wells County: Arkansas 1 A. West, dry, T.D. 5,606 ft.

San Patricio County: Texas 1 J. T. Ingalls, dry, T.D. 6,001 ft.

Fields

Agua Dulce, Nueces County: C. P. Burton 2 Ingram, 87 bbl., 9/64-in. choke, perf. casing 6,396-6,410 ft., T.D. 6,443 ft.

H. H. Howell 9 Schulze, 48 bbl., distillate, 300,000 cu. ft. gas, open flow, perf. casing 6,942-59 ft., T.D. 7,041 ft.

Mid-Continent 1 Cage, 120 bbl., 3/32-in. choke, perf. casing 6,986-98 ft., T.D. 7,030 ft.

Renwar 2 Knight, 204 bbl., ⅛-in. choke, perf. casing 7,095-7,105 ft., T.D. 7,116 ft.

Simmonds & Perry 1 Simmonds, 148 bbl., ⅛-in. choke, perf. casing 6,836-48 ft., T.D. 6,950 ft.

Texon Royalty 7 Horner, 198 bbl., ⅛-in. choke, perf. casing 7,049-57 ft., T.D. 7,057 ft.

Alice, Jim Wells County: Southern Minerals 2 Stillwell, old well, 106 bbl. oil and 24 bbl. salt water, 5/32-in. choke, T.D. 7,735 ft.

Greta, Refugio County: Monday 2 Heard, 75 bbl., ⅛-in. choke, perf. casing 4,390-4,400 ft., T.D. 4,452 ft.

Midway, San Patricio County: W. F. Morgan 5 Schmidt, 93 bbl., ⅛-in. choke, perf. casing 5,324-26 ft., T.D. 5,336 ft.

Minnie Bock, Nueces County: Windsor 3 Parr, 27 bbl., jetting, perf. casing 3,713-19 ft., T.D. 3,920 ft.

Seeligson, Jim Wells County: Sun 4 Canales, 151 bbl., 22 hr., 9/64-in. choke, perf. casing 5,954-58 ft., T.D. 5,988 ft.

South Sinton, San Patricio County: Tide Water 1 San Antonio Loan & Trust Co., 66 bbl. distillate and 4,560,000 cu. ft. gas, ¼-in. choke, perf. casing 6,675-82 ft., T.D. 6,687 ft.

LAREDO DISTRICT

Wildcats

Gonzales County: Frank Brown 1 Parr, dry, T.D. 2,121 ft.

(Continued on Page 71)

EASTERN TEXAS FIELDS

Field Drilling Nearly Halted; Wildcat Extends Chapel Hill

By D. H. STORMONT

DALLAS, Tex.—The announcement this week of only two new locations in the Hawkins field in Wood County brought work in proven areas in the East Texas district to a virtual standstill. Hawkins field announced the completion of five oil producers and Willow Springs announced the completion of one gas well. There were no new wildcat locations.

Meantime, the Chapel Hill field in Smith County came in line for a 1-mile east extension. Gas-distillate production from the Pettit lime was assured at Chapel Hill Gas Distributing Co. 1 Gilliam, A. B. Harrison Survey. The extension well flowed 10 bbl. of distillate per hour through ⅜-in. choke on tubing. Production was natural through casing perforations from 7,980-8,010 ft. Casing pressure was 1,475 lb. and tubing pressure was 1,175 lb. In the Rodessa section of the Glen Rose 1 Gilliam had previously found water. At the end of the week, operator was treating the test with 4,000 gal. of acid. Total depth is 8,376 ft. in the Travis Peak, which was topped at 8,370 ft.

Wildcats Drilling

In Leon County Gier Brothers and Jackson 1 DeVaugh, Little Survey, which was reported the previous week as high on the structure, logged slight porosity in the bottom of a core from 5,781-93 ft. At the end of the week, the wildcat was coring below 5,793 ft.

First marker was reported for Donnie Petroleum Co. 1 Welborn, Webb Survey, which is believed running structurally high for the southeastern Hopkins County sector. With an elevation of 526 ft., 1 Welborn picked up the Pecan Gap at 2,435-75 ft. and is drilling below 3,700 ft. The wildcat is scheduled to test the Paluxy sand.

EASTERN TEXAS COMPLETIONS

Wildcats

Fannin County: Damon Oil Co. 1 A. L. Choffin, A. C. Ketchin Sur., 4 mi. N and E of Bonhan, dry at 1,516 ft.

Gregg County: Lone Star Gasoline Co. 1 B. A. Skipper, John Belcher Sur., 3½ miles S of Willow Springs, 38,000,000 cu. ft. gas, T.D. 7,304 ft.

Henderson County: Iowa-Payne Oil Co. 1 J. Weisner, M. Goliher Sur., 2 mi. N of Frankston, dry at 5,126 ft., top Austin 4,510 ft., top Woodbine 5,004 ft.

Houston County: O. W. Killian 2 Houston County Coal Co., J. Henley Sur., 1½ mi. N of Lovelady, dry at 3,416 ft., top Wilcox 2,290 ft.

Fields

Hawkins, Wood County: Humble 2 W. D. Dagnell, W. Parker Sur., 110 bbl. in 6 hr., ¼-in. choke, top Austin 3,760 ft., top Woodbine 4,100 ft., pay 4,499-4,607 ft.

Humble 4 E. M. Faulk, J. Pollock Sur., 113 bbl. in 6 hr., ¼-in. choke, top Austin 4,300 ft., top Woodbine 4,537 ft., T.D. 4,877 ft.

Humble 2-D W. S. Shamburger, J. P. Moseley Sur., 59 bbl. in 24 hr., pumping, top Austin 4,227 ft., top Woodbine 4,529 ft., T.D. 4,816 ft.

Humble 2 B. A. Wells, G. Brewer Sur., 91 bbl. in 6 hr., ¼-in. choke, top Austin 4,032 ft., top Woodbine 4,264 ft., pay 4,510-4,881 ft.

Stanolind 2 Sam Jeffery, H. F. Robins Sur., 87 bbl. in 6 hr., ¼-in. choke, top Austin 4,300 ft., top Woodbine 4,550 ft., pay 4,672-4,848 ft.

Wildcat East of Haynesville Finds Deep Lime Pay

By R. MARNE SANFORD

SHREVEPORT, La.—Several weeks ago a wildcat in Claiborne Parish found commercial shows of gas and distillate in the deep Smackover lime below 10,000 ft. at a point just north of the Lisbon field. During the past week another long drilling wildcat in the same parish encountered shows of gas and oil in a deep lime also below 10,000 ft. The new test is Hunt Oil Co. 1 Mitchiner, 15-23-7, east of the town of Haynesville. It was last reported drilling ahead below 10,966 ft. after coring from 10,924 ft. and recovering 16 ft. and 10 in. of sand with odor and show of both gas and oil. Below this depth, however, the well encountered shale and was still in this zone. This led operators to the opinion that the deep Smackover lime itself has not yet been encountered.

In the same parish and north of Lisbon, Union Producing Co. 1 McDonald, wildcat test which found shows of gas in the Smackover lime several weeks ago to extend the one-well deep field opened last March, has now reported initial tests. No. 1 McDonald, 13-2-5, drilled out cement retainers and reconditioned hole after cementing off casing which was found split at 10,560 ft. Initial tests showed still a strong gas pressure and as the week closed preparations were under way to gage the well. It was the deepest hole ever drilled in North Louisiana, being bottomed at 11,884 ft. in the Smackover lime.

Meanwhile, Union Producing Co. spudded 1-B Meadows, the third test for the deep area and located between the first and second wells drilled. The original discovery well for the deep field was completed as a distillate and gas producer from the Smackover lime.

Haynesville Pettit Lime Level Active

Late in 1941 a new and deeper producing level for the old Haynesville field of Claiborne Parish was opened from the Pettit lime. Immediately some 15 or 20 locations were staked, only a limited number of which were granted permits to drill at that early stage in the developmental program. As the past week closed many of the other tests which had later been granted drilling permits on a 40-acre pattern were in the completion stages. One well was completed and two others were nearing the producing level. The new well is Blackwell Oil & Gas Co. 1 Milner, 22-23-8, offsetting the discovery. Through casing perforations at 5,455 ft. the well came in flowing approximately 250 bbl. daily. The discovery was T. L. James 1 Aiken, NW SW 27-23-8, completed for 288 bbl. daily from perforations opposite the Pettit lime from 5,431-40 ft.

Nearing the pay level was Ohio Oil 1 F. Bond, 21-23-8, which was coring at 5,254 ft. Ohio Oil 1 Sherman, 23-23-8, was drilling shale at 5,100 ft. In this same deep Pettit lime area there were five other tests drilling at the close of the week and three new locations were staked during the past 7-day period.

ARKANSAS

The Midway field in Lafayette County, Arkansas, became the most active one area in the district the past week as a total of 24 locations have been staked since its discovery about a month ago, and 12 of this number have already started.

Before many days some of these active tests in the field will be down to the pay level and more may then be known regarding the scope and extent of this highly acclaimed field. A report of the active operations in the field area is as follows:

Roberts 1 Bond, 11-15-24, drilling at 4,100 ft.
Barnsdall Oil 1 Dobson, 11-15-24, drilling 3,900 ft.
Barnsdall Oil 2 Dobson, 10-15-24, drilling 3,800 ft.
Barnsdall Oil 1 Creek, 10-15-24, W.O.C. at 620 ft.
Barnsdall Oil 2 Bond, 11-15-24, drilling cement at 620 ft.
Barnsdall Oil 3 Bond, 11-15-24, drilling 2,000 ft.
Barnsdall Oil 4 Bond, 11-15-24, rigging up materials.
Barnsdall Oil 1 Beck, 14-15-24, waiting on cement at 620 ft.
Arkansas Fuel Oil 1 Creek, 10-15-24, drilling 3,900 ft.
Rutherford 1 Stamp Land, 3-15-24, drilling 2,000 ft.
Magnolia 1 Johnson, 11-15-24, drilling 1,600 ft.
Frankel Bros. 1 Burns, 10-15-24, drilling 1,300 ft.

The other locations that have been staked in the field are expected to get under way just as soon as materials can be made available.

(Continued on Page 73)

Southwest Texas Fields

(Continued from Page 70)

Hidalgo County: Magnolia 4 Guerra, dry, T.D. 6,400 ft.
Rowan & Hope 1 C. B. Rose, dry, T.D. 7,505 ft.
Zapata County: Henshaw Brothers 1 Ramirez, dry, T.D. 396 ft.

Fields

Colorado, Jim Hogg County: Humble 46-B King, 95 bbl., ⅞-in. choke, T.D. 2,921 ft.
Cuellar, Zapata County: V. G. Schimmel 1 Cuellar, dry, T.D. 2,011 ft.
Glen, Webb County: Glen Harroun 1 Bruni, dry, T.D. 2,165 ft.
Jacob, Live Oak County: Loma 16-B Jacobs, dry, T.D. 1,002 ft.
Neuhaus, Jim Hogg County: Adams, Lucky et al 4 Gallagher, dry, T.D. 3,512 ft.
South White Creek, Live Oak County: Simmons 3 Cline, dry, T.D. 1,830 ft.
Stelzig & Clark 2 Derrough, dry, T.D. 1,965 ft.
Woodman & Norcross 1 Needham, dry, T.D. 2,373 ft.
Sun, Starr County: Humble 1 Saenz, 80 bbl., ⅛-in. choke, T.D. 4,652 ft.
Yturria, Starr County: Sun 4-A Chapotal, 144 bbl., 9/64-in. choke, sand 4,223-29 ft.

SOUTH CENTRAL TEXAS DISTRICT

Fields

Dale, Caldwell County: Ralph Ogden 1-B Miears, dry, T.D. 2,303 ft.

Ohio Fields

(Continued from Page 69)

Sidney Garrett, Sec. 27, 550,000 cu. ft. gas, Clinton, T.D. 4,281 ft.
Muskingum County, Harrison Township: Pure Oil 1 Phillip Ribble, Sec. 14, 740,000 cu. ft. gas, Clinton, T.D. 4,281 ft.
Industrial Gas Corp. 3 C. S. Stutes, SW Sec. 2, dry, through Medina, T.D. 4,310 ft., no showing in Clinton sand.
Falls Township: Atha Co. 7 W. H. Atha, second quarter, show oil, shot, plugged, Clinton 3,540-76 ft., T.D. 3,791 ft.
Wayne Township: Atha Co. 2 Chas. W. Fisher, Sec. 8, dry, Clinton 3,790-3,840 ft., Medina 3,904-11 ft., T.D. 4,045 ft.
Wayne Township: Atha Oil Co. 1 Charles W. Fisher, SE Sec. 8, dry in Clinton sand and Medina, T.D. 4,057 ft.
Perry County, Clayton Township: Preston Oil Co. 1 John J. Wilson, SE Sec. 5, 14 bbl. and 10,000 cu. ft. gas, Clinton sand, T.D. 3,288 ft.
Bearfield Township: J. B. Orndoff 1 O. C. Fleming, Sec. 16, 160,000 cu. ft. gas, shot, Keener, T.D. 406 ft.
Harrison Township: Clyde Foraker 2 B. F. Thomas, Sec. 29, 4,120,000 cu. ft. gas, Clinton 3,557-99 ft.
Thorn Township: Industrial Gas Corp. 2 Sarah Humberger, Sec. 13, 220 bbl., shot, Clinton, T.D. 2,806 ft.
Summit County, Green Township: East Ohio 1 S. M. Hartong, Sec. 22, 500,000 cu. ft. gas, shot, Clinton shell 4,224-46 ft., Clinton sand 4,330-54 ft., dry, T.D. 4,453 ft.
Tuscarawas County, Sandy Township: Natural Gas of W. Va. 1 H. Gsell, Sec. 14, 550,000 cu. ft. gas, shot, Clinton, T.D. 4,949 ft.
Washington County, Aurelius Township: Joe Hall 70 Levi Hall, Sec. 32, 1½ bbl., shot Buell Run, T.D. 460 ft.
Fearing Township: Lorentz Bros. 6 Catherine Lorentz, Lot 103, 5 bbl., shot, M-500-ft. sand, T.D 931 ft.
Newport Township: John Thornley et al 3 George Hayes, Sec. 21, dry, T.D. 722 ft.

WESTERN KENTUCKY COMPLETIONS

Daviess County, St. Joseph district: Miller 2 Mary J. Clayton, dry hole, T.D. 2,305 ft.
Utica district: Petroleum Co. 4 R. C. and Delia Jewell, dry hole, T.D. 1,750 ft.
Union County, Morganfield district: Sun & Ky. Natural Gas 5 J. W. Reyburn, dry hole, T.D. 1,356 ft.

Oklahoma Fields

(Continued from Page 67)

rada Petroleum Corp., Stanolind Oil & Gas Co., Phillips Petroleum Co., Texas Co., Atlantic Refining Co., McGraw Oil Co., and C. P. Quinlan.

On the Apache trend in Comanche County, the Texas Co. staked 1 Ed D. Roll, C SE SW 5-3n-10w, Several wildcats already have been drilled in that district without success.

OKLAHOMA COMPLETIONS

Wildcats

Creek County: Malernee 1 Rountree, SW NW SW 2-14-7, flowed 100 bbl., pinched, Bartlesville 3,119 ft., T.D. 3,130 ft., *discovery*.
Lincoln County: Trigg 1 Bailey, SE SW 22-15-5, dry, Prue 3,410 ft., T.D. 3,495 ft.
Logan County: Cities Service 1 Babcock, SE NE NE 10-15-4w, flowed 364 bbl. in 7 hr., Layton 5,225 ft., T.D. 6,800 ft., P. B. 5,115 ft., *discovery*.
Helmerich & Payne 1 Detweiler, SE SW NE 22-18-2w, dry, Viola 5,690 ft., Wilcox 5,831 ft., T.D. 5,966 ft.
Okfuskee County: Keriyn 1 Klabzuba, SE SW SE 18-11-7, dry, Misener 4,536 ft., Hunton 4,538 ft., Wilcox 4,813 ft., T.D. 4,831 ft.

Fields

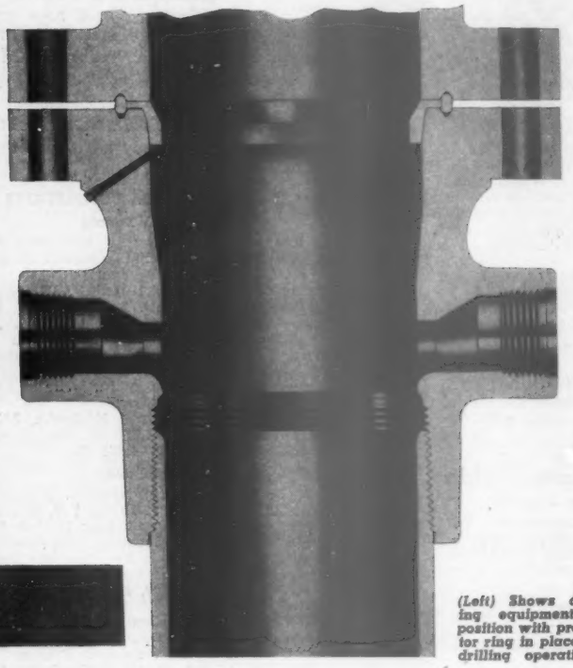
Allen, Pontotoc County: Mary F. 2 Shields, NW NE 33-5-8, dry, sand 712-16 ft., T.D. 933 ft.
Apache, Caddo County: Sinclair Prairie 3 Lewis, SW NE SW 2-5-12w, location abandoned because of M-68.
North Bebee, Pontotoc County: Champlin 2 Walker, NW NW 16-5-5, dry, Hunton 2,192 ft., T.D. 2,000 ft.
North Bristow, Creek County: Curtis Oil 3 Toney, NE NW 19-17-8, dry, Dutcher 2,975 ft., T.D. 3,019 ft.
Cement, Caddo County: English Drilling 1 Vann, SW SW NW 4-5-9w, gaged 2,500,000 cu. ft. gas, 1,500 lb. R.P., pay 6,783-6,819 ft., T.D. 6,978 ft.
Pace 2 Walker, NW SW NE 1-5-10w, dry, T.D. 3,487 ft.
Darby Petroleum 3 Loose, SW SW SE 27-6-10w, gaged 76,000,000 cu. ft. gas, 1,590 lb. R.P., pay 4,664-99 ft. and 4,964-94 ft., T.D. 5,841 ft.
Stephens 1 Farwell, NE SW 27-6-10w, old well, old T.D. 5,728 ft., T.D. 6,204 ft., perf. 5,560-5,760 ft., gaged 5,000,000 cu. ft. gas, 1,875 lb. R.P.
Chickasha, Grady County: Sinclair Prairie 5 Povler-A, NW NE 22-5-8w, gaged 157,000,000 cu. ft. gas, 1,805 lb. R.P., Charlson zone 4,095 ft., T.D. 5,325 ft.
Little Nick 1-A Glover, NE NE 27-5-8w, gaged 1,500,000 cu. ft. gas, pay 2,500-90 ft., T.D. 3,805 ft., whipstocked, new hole T.D. 2,640 ft.
Doyle (deep), Stephens County: Cox 1 Burns, NW NE 13-1-5w, flowed 145 bbl., T.D. 6,303 ft.
West Hewitt, Carter County: Gibson & Jennings 13 Choate, NE SE 18-4s-2w, flowed 200 bbl., pay 2,222-81 ft., shot 2,234-72 ft., T.D. 2,300 ft.
Hotulke, Pottawatomie County: Alma 2 Herrington, NE NW 24-9-4, flowed 191 bbl., Hunton 4,170-4,213 ft., T.D. 4,220 ft.
Big Chief 1 Kessinger, NW SW SW 25-9-4, pumped 56 bbl. oil and 25 bbl. water, Hunton 4,202 ft., T.D. 4,224 ft., acid and shot.
West Hotulke, Pottawatomie County: Allen 2 Webber, NW NE NE 27-9-4, pumped 240 bbl. oil and 100 bbl. water, Viola 4,334-68 ft., T.D. 4,447 ft.
Oklahoma City, Oklahoma County: Barnsdall 7 Brocht, SE NW SW 23-12-3w, pumped 72 bbl., Wilcox 6,420 ft., T.D. 6,603 ft.
St. Louis, Pottawatomie County: Sinclair Prairie 4 Rice-A, NW SW NE 17-7-4, pumped 245 bbl., Viola 3,955 ft., T.D. 4,046 ft.
Magnolia 6 Hughbanks, NE SE NW 17-7-4, pumped 250 bbl., Viola 3,940 ft., T.D. 4,018 ft.
South Woolsey, Stephens County: R. W. Fair 4-A Baker, NE SW NE 35-2s-6w, pumped 15 bbl., lime 1,809-25 ft., T.D. 1,840 ft.

Miscellaneous

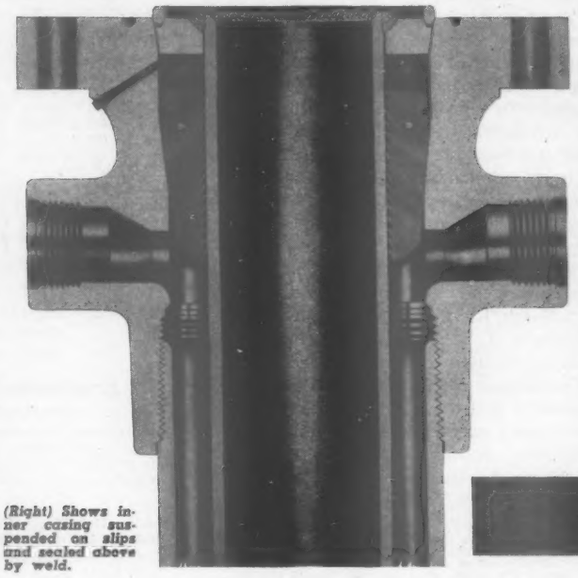
Jefferson County: Seitz 1 Brown, NE NE 23-6s-6w, dry, pay 1,828-32 ft., T.D. 2,247 ft.
Le Flore County: Western Oklahoma 1 Hinton, NE SW 28-9-24, gaged 6,000,000 cu. ft., pay 5,112-19 ft., T.D. 5,282 ft.
Western Oklahoma 1 Redwine, S½ SE 21-9-24, gaged 10,000,000 cu. ft. gas, pay 5,073 ft., T.D. 5,226 ft.
McIntosh County: McNutt 1 Wolfe, SE NW 18-12-17, dry, Dutcher 1,918-45 ft., T.D. 2,338 ft.
Pontotoc County: L. & L. 2 McCool, NE NW SE 6-4-7, dry, sand 1,493-96 ft., T.D. 1,595 ft.

The RHX RECTORHEAD

For Safer Installation with Higher Pressure Units



(Left) Shows drilling equipment in position with protector ring in place for drilling operations.



(Right) Shows inner casing suspended on slips and sealed above by weld.

A *New* Improvement added to an already widely Proved Casing Head

THE new RHX RECTORHEAD embodies all the advantages of the well known RH Slip Suspension RECTORHEAD, yet goes even further in providing positive, safe, economical well control.

Its simplified design and easy installation is made possible by Rector's exclusive patented pressure sealing and casing hold-down seal ring. It permits use of a higher pressure tubing head, flanged direct, for example, a 6000 lb. RHX RECTORHEAD, with 900 series flange, may be set and used during drilling operations, with the blowout preventer flanged direct. After oil string is set, a 10,000 lb. test tubing head, with 900 series flange on bottom end may be flanged directly to the RHX RECTORHEAD, using the restricted ring groove. By exposing less area to pressure than the standard ring groove for that particular flange size and series, the restricted ring groove permits the tubing head to be tested and used at the next higher pressure rating.

There is a Rector Casing Head, Rector Tubing Head, or a Rector Assembled and Tested Christmas Tree to meet every drilling, completion and production requirement.

In addition to this new feature, the RHX RECTORHEAD is fitted with a protector ring used during drilling operations. This ring, as shown in the illustration above, guards the inner groove from damage by bit or kelly. This ring has the same bore as pipe below, and the lip between the flanges does not interfere with the outer API Seal Ring. After drilling operations, the ring may be quickly and easily removed. If a weld test is desired, a pressure sealing packoff is inserted between slips and welding ring, and test pressure applied through the port in the side of the head directly against weld.

It is the safest, most economical means of well completion. By flanging the heads together direct, intermediate flanges and special bolts are eliminated, meaning less material, and therefore less cost, involved.

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Mile Northwest Extension Seen for Turner Valley

By VICTOR LAURISTON

CHATHAM, Ont. — In North Turner Valley, Atlas-British Dominion 2, LSD 4, 17-21-3w5, is finishing below 8,600 ft., after getting the Madison limestone at 8,295 ft. Both the upper and lower porous zones indicate good production. This completion will extend the field nearly a mile northwest of Major Oil Investments 4, previously the most northerly producer.

Major Oil Investments 4, LSD 8, 8-21-3w5, finished at 7,836 ft. with the Madison at 7,415 ft., has been cleared of water forced into the formation to control the pressure when the well ran wild, and is being given major acid treatment. While clearing water it flowed 667 bbl. of crude in 24 hours and after complete acidization is expected to at least equal Major 3, which has 1,113 bbl. daily allowable, the largest in the field.

Foothills Proves Big Well

Foothills Oil & Gas 10, LSD 2, 4-21-3w5, finished at 8,069 ft., with Madison at 6,619 ft. after initial acid wash flowed 890 bbl. in 24 hours with 1,400 ft. gas-oil ratio. Acidizing and testing is still in progress. The well, which drilled 1,450 ft. in the Madison without reaching the black lime, is expected to get a quota around 1,000 bbl. daily.

TURNER VALLEY LIME TESTS

North Turner Valley: Miracle Royalties 2, LSD 6, 4-21-3w5, got the Madison at 7,250 ft., encountered a break at 7,313 ft., and reentered the lime at 7,340 ft.

West Central section: Anglo-Canadian Oils 11, LSD 5, 25-19-3w5, below 7,997 ft., Madison at 7,885 ft.

Alberta Pacific Royalties 1, LSD 14, 6-19-2w5, T.D. 8,325 ft., Madison at 7,872 ft., acidizing upper porous.

NEW TESTS STARTING

North Turner Valley: Northcross Royalties 1, LSD 8, 15-22-4w5, derrick up.

Hastings Royalties 1, LSD 3, 30-21-3w5, spudded and below 670 ft.

Royalite Oil 64, LSD 13, 22-20-3w5, working on derrick.

Offset Wells Located

Several offset wells have been spotted in the prolific new extension to North Turner Valley. Foothills Oil & Gas 13, LSD 7, 4-21-3w5, offsets Foothills 10 producer to the north, while Home Oil 10, LSD 15, 33-20-3w5, is immediately south. Miracle Oils 3, LSD 13, 33-20-3w5, offsets Alberta Oil Incomes 2 producer. All three are on Home Oil Co. acreage. Northwest-Hudson's Bay 7, LSD 14, 8-21-3w5, is southwest of Atlas-British Dominion 2, now being finished in the lime.

Oyen Test Started

A new potential field south of Oyen, in eastern Alberta, is being tested by Standard Oil Co. of British Columbia, which has been active in the Steveville field. Standard-Oyen 1, LSD 16, 34-26-5w4, has spudded and is below 545 ft. after setting surface casing. Location is 6 miles south and west of Oyen, and northwest of Enpress.

Monitor Operations

In the Monitor district, eastern Alberta, McColl-Frontenac 1, LSD 4, 5-32-4w4, about 46 miles north of the Oyen well, is in lime below 3,500 ft. Location is being made for a second test.

In the Tilley district, Northwest Co. 1, LSD 1, 7-17-12w4, bottoming at 3,208 ft., has perforated casing and is testing production at 3,205 ft. No. 2 will be started about a mile north of the first test.

Vermilion Field

Fire at Princeville Petroleums 2, LSD 1, 31-50-5w4, destroyed the pumping house and damaged the mast-type rotary outfit which was installing production equipment. Well is again on production under its own power. Princeville 3 has been spotted 1,320 ft. north, in LSD 8, 31-50-5w4, and Victorilion Royalties 1 has location 1,320 ft. west. Flobell 1, LSD 12, 29-50-5w4, is below 195 ft. after cementing casing.

New Test for Saskatchewan

The Horsham area in southwestern Saskatchewan, about 60 miles north of the Medicine Hat gas field in Alberta, will be tested by Boundary Petroleums of Regina, which has derrick and standard tools on location, LSD 10, 26-17-29w3. Location is immediately east of Hilda, Alta. A geophysical survey by G. P. d'Aigneaux of Calgary indicates production at shallow depth.

New Oil Structures Mapped

Investigations in Alberta during 1941 by geologists of the federal Department of Mines and Resources have resulted in the mapping of several previously untested oil structures. In the Marble Mountain area, the Stafne Ridge anticline was traced southward for approximately 8 miles; while another possibly favorable structure was indicated on James River. In the western part of the Dyson Creek area two structures

(Continued on Page 79)

Crude-Oil Prices

Representative selected crude prices from all sections of the country appear below:

East Texas	$1.25
Conroe	1.4[illegible]
Tepetate, Louisiana	1.18
Smackover, Arkansas, heavy	.83
Illinois basin	1.37
Pecos County, Texas	.9[illegible]
Lance Creek, Wyoming	1.12
Bradford, Pennsylvania	2.75

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity	Signal Hill Calif.	Oklahoma, Kansas	Gulf Coast, Texas	West Texas, Lea County, N.M.
18-18.9	$0.80	...	...	...
19-19.9	.84	...	$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9	...	1.07	1.30	.94
32-32.9	...	1.09	1.32	.96
33-33.9	...	1.11	1.34	.98
34-34.9	...	1.13	1.36	1.00
35-35.9	...	1.15	1.38	1.02
36-36.9	...	1.17	1.40	1.04
37-37.9	...	1.19	1.42	1.06
38-38.9	...	1.21	1.44	1.08
38-39.9	...	1.23	1.46	1.10
40 and above	...	1.25	1.48	1.12

La-Arkansas Fields

(Continued from Page 71)

NORTH LOUISIANA COMPLETIONS

Wildcats

Rapides Parish: Carter Oil 1-B Catahoula, SW NE 32-6n-3e, top Vicksburg 883 ft., Cockfield 1,370 ft., Cook Mountain 1,930 ft., Sparta 2,079 ft., Cane River 2,770 ft., Wilcox 2,868 ft., dry at 5,755 ft.

Sabine Parish: J. H. Trotter 1 Lake Charles Trust Co., SE SE 5-5n-12w, dry 2,535 ft.

Fields

Bellevue, Bossier Parish: Wyche 1 Kendrick, NE SW 22-19n-11w, dry at 420 ft.

Sligo, Bossier Parish: Jones 3 Smith, SW NE 14-17n-12w, location abandoned.

Caddo, Caddo Parish: J. C. Prime 1 Handschumacher, NE NE SW 18-21n-15w, 25 bbl., 1,670 ft.

Nebo, La Salle Parish: H. L. Hunt 7-C Goodpine, SW NE 29-8n-3e, dry at 3,926 ft.

Hunt 71-F Goodpine, NW NW 22-37n-3e, 121 bbl. oil and 14 bbl. water, perf. casing 4,020-26 ft., T.D. 4,120 ft.

J. L. James 2 Graham, Lot 3 of irregular Sec. 40-7n-3e, 150 bbl. oil, perf. casing 3,688-98 ft., T.D. 4,111 ft.

Placid Oil 70-F Goodpine, NW NW 24-7n-3e, dry at 4,075 ft.

Little Creek, La Salle Parish, H. L. Hunt 110-F Goodpine, 146 bbl. oil and 30 bbl. water, perf. casing 2,432-35 ft., T.D. 2,670 ft.

South Olla, La Salle Parish, Placid Oil 11-B Goodpine, dry at 2,934 ft.

Placid Oil 19-A Tremont, NW SW 26-9n-2e, 82 bbl. oil and 28 bbl. water, perf. casing 2,635-40 ft., T.D. 3,594 ft.

ARKANSAS

Fields

Macedonia, Columbia County: McAlester Fuel Oil and Mid-Continent Oil 1 Brewer-Womack, S½ SE 15-18s-21w, 128 bbl. distillate and 256,000,000 cu. ft. gas, T.D. 8,910 ft.

Midway, Lafayette County: Barnsdall Oil 1 Roberts, SE NW 11-15s-24w, location abandoned.

McKamie, Lafayette County: Carter Oil 2 M. Hanes, NW 31-17s-23w, 336 bbl. distillate and 49,700,000 cu. ft. gas, T.D. 9,380 ft.

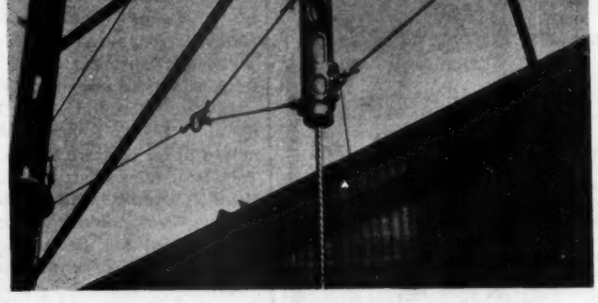
Mount Holly, Union County: Atlantic Ref. Co. 1-B M. Davis, SW SW 10-17s-18w, 111 bbl. oil and 14 bbl. water, perf. casing 7,184-86 ft., T.D. 7,246 ft.

Troy, Nevada County: Berry Asphalt Co. 1 McRae, SW SW 4-4s-20w, 35 bbl., T.D. 1,200-8 ft.

Wildcats

Union County: M. E. Bolding 1 Citizens Bank, NW SE 1-19s-13w, dry at 4,004 ft.

Wire line conservation requires this protective Guide



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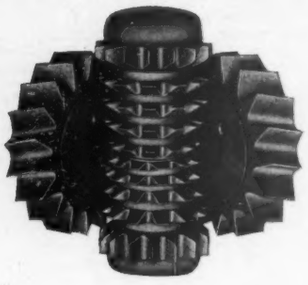

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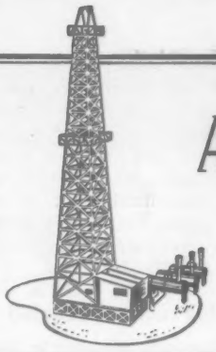

Among the Drilling

Contractors and Companies Profit by Block Letting

THE block letting of contracts, in which one contractor is allotted a group of wells to drill, results in an over-all saving for both the oil company and the drilling contractor. Several large companies have found it the most successful method available for the reduction of drilling and development costs. It also permits the contractor and the company to arrive at the cost-of-drilling figure which is fair and acceptable to both.

Principal attraction to the drilling contractor is the elimination of down time between locations. Where wells are drilled individually, the rig is torn down and stacked at the conclusion of drilling on each location. When a new contract is obtained the rig must be moved and rigged up again. Generally more time is consumed in stacking the rig than in rigging it up.

Drilling in one area also permits an extensive study to be made of the conditions and an economical mud and bit program outlined. This may have to be varied to some extent as the work progresses but by the time the second well is drilled in a field, the drilling crew is generally approaching the most efficient program possible for the conditions in that area. There is also the reduced labor turnover which increases the efficiency of the drilling crews and reduces the insurance costs.

The oil companies effect considerable saving through a reduction in the supervision required. The production department is also permitted to plan its work schedule for several months ahead so a small force can be kept working continuously instead of having peak periods which require the employment of considerable transient labor. Where the drilling contractor is furnishing the water and gas supply, the laying of lines can be eliminated from the company expense.

Several of the larger companies have tended more toward block letting of contracts in the last several years. Generally such companies have a list of acceptable contractors each of whom is assigned a group of wells to drill. This prevents a charge of favoritism within the trade and it has an added advantage in that it permits expansion of the drilling program on short notice.

BREWSTER-BARTLE Drilling Co., Houston, Tex., is starting drilling operations on three wildcats. Fifteen miles north of Houston, contract was received from Strake Petroleum Co. 1 Phoenix Dairy, located in the Peter Craft Survey. Approximately 5 miles west of the Washburn field, La Salle County, Texas, rotary was being moved in for Navarro Oil Co. 1 R. L. Talbert, a Wilcox test located in the H.&G.N. Survey, while in De Witt County, Texas, another Wilcox test is being drilled for the Adams Oil & Gas Co., just east of the Yorktown townsite.

ROWAN & HOPE, San Antonio, Tex., are starting a new wildcat operation in Jackson County, Texas, for themselves. The well is 1 Simmons, located in the W. J. E. Heard Survey, about 2 miles east of the town of Edna.

ROTARY CORE Drilling Co., Oklahoma City, Okla., is using cable tools to finish a directional hole at British American et al 1 Lincoln Terrace in the Oklahoma City field. The hole was drilled to 6,396 ft. with rotary tools, then casing was set and drilling below the casing is being done with tools. Drill site is on the state Historical Museum tract, but the bottom of the hole is under Lincoln Terrace homes.

AMERICAN Drilling Corp., Hobbs, N. M., has the contract and an interest in a 5,200-ft. wildcat to be drilled by Mascho Oil Co. of Midland, Tex., in SW NW 18-12s-35e, Lea County, New Mexico, about 7 miles west of Tatum. Location is on a farmout from the Tide Water Associated Oil Co. state lease. Supporting the test are L. H. Wentz of Ponca City, Okla., F. J. Danglade, Continental Oil Co., Skelly Oil Co. and Texas Pacific Coal & Oil Co.

LLOYD NOBLE, Ardmore, Okla., announced tentative location for a well in NE NE SW 13-6s-6e, west of Aylesworth, eastern Marshall County, Oklahoma, which he will drill together with M. A. Neff and Roy A. Godfrey of Madill. The test is to go to the McLish, expected at around 5,000 ft., and has the support of a number of companies.

LOFFLAND BROTHERS, Houston, Tex., is moving a rotary to the West Gueydan field, Vermilion Parish, Louisiana, for Pure 2 Vermilion Irrigation Co., a semiwildcat located northeast of production in 41-12s-2w.

WISE & FALL, San Antonio, Tex., received contract for a 5,000-ft. Wilcox test located northwest of the Washburn field in La Salle County, Texas. The well will be drilled for L. C. Chenoweth and H. G. Nelms on the Chenoweth lease in the L. Menchaca Survey.

ALLEN & MORRIS, San Antonio, Tex., recompleted Slick-Urshel 1 Grissom as the discovery well of the South Caesar field, Bee County, Texas. The well is flowing at the rate of 15 bbl. per hour from the Carrizo sand, which is the first pipe line-oil to be produced from this

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Contractors

sand along the trend. Two rotaries are operating in Refugio County, Texas, for the Shield Oil Co., another in the Odem field, San Patricio County, Texas, for Seaboard Oil Co. In the Seeligson field, Jim Wells County, Texas, two additional producers were completed for the Transwestern Oil Co., while in the Agua Dulce field, Nueces County, Texas, one rotary is running for the Texon Royalty Co.

TURNER Drilling Co. has contracted to drill for Cities Service Oil Co. in Section 29, Winterfield area, Clare County, Michigan.

VERNON HOOK has derrick up for a test to be drilled for E. Benneght in Section 5, Chase area, Lake County, Michigan.

PROSPECT Drilling Co., Houston, Tex., is moving a rotary to Fort Bend County, Texas, for its 1 A. E. Holmes, a wildcat located southwest of Clodine in the S. Isaacs Survey.

TISSUE Drilling Co., Houston, Tex., has spudded Circle Oil Co. 1 Sugarland Industries, located on the northwest flank of the Sugarland field, Fort Bend County, Texas.

L. D. VONDE VELD, drilling contractor, has moved his headquarters from Ponca City, Okla., to Tulsa.

INGLING & PARKER, Wichita, Kans., are drilling a deep test for M. & L. Oil Co., ¼ mile west of production of the Lindsborg Viola lime pool, McPherson County, Kansas. At latest report the hole was down below 3,100 ft.

RICHMOND Drilling Co., Midland, Tex., is drilling a wildcat test for itself 8 miles northeast of the Lovington pool, eastern Lea County, New Mexico. The test, 1 State, is drilling below 4,600 ft. in anhydrite and lime.

LUPHER Drilling Co. has received contract to drill a test for Pure Oil Co. in Section 29, Winterfield area, Clare County, Michigan; and two others for the same company in Section 25, Pinora area, Lake County. This contractor also will drill a test for Louis Rose in Section 25, Pinora area.

BASIN Drilling Co., Centralia, Ill., has started a test on the Duhamel farm, NE NW SW 30-6s-2e, Franklin County, Illinois.

MARKLEY-BANKHEAD, Inc., Lake Charles, La., has moved its offices to Houston, Tex. This drilling firm is headed by T. G. Markley and A. J. Bankhead.

CLIFFORD A. PERRY has contract to drill a test for Perry, Gould & Cross, Section 18, Hopkins area, Allegan County, Michigan. In the same section, Muskegon Development Co. has contract to drill for Regal Dutch Petroleum Co.

FRED J. WHITE has contracted to drill a test for Thomas Fensom in Section 10, Salem area, Allegan County, Michigan. This contractor now is drilling for Regal Dutch Petroleum Co. in Section 14, same county.

DXE Drilling Co., Dallas, Tex., is moving in rig to drill 5 St. Mary Parish School Land, an Atlantic Refining Co. lease in the Bayou Sale field, St. Mary Parish, Louisiana.

Period of Reduced Activity Used for Remodeling Rigs

A PERIOD of uncertainty faces the drilling contractor with no general agreement as to its length. Principal cause is the uncertainty on the part of the Government and the oil companies regarding the immediate future of the petroleum industry. While M-68 has had an important effect, the reorganization of the plans of oil companies is having a more important one.

The total effect of the war is difficult to estimate, some contractors feeling that the present situation is only temporary and others feeling that it may be for the duration.

There appears to be very little disposition on the part of drilling firms to accept work at a price which does not take into consideration increased costs of operating drilling rigs. There is also considerable resistance to the effort of some oil companies to take advantage of the rig surplus caused by drilling curtailment. Most contractors seem at the present time to be more concerned with keeping equipment in first-class operating condition until a period of accelerated drilling arrives rather than with seeking work at the present time. Considerable wildcat work is anticipated.

The drilling contractors and the drilling departments of oil companies owning rigs plan to spend the next few months in reorganization and development work. This will allow remodeling of rigs which has been postponed due to the rush of work over the past year and will also permit the development of new equipment and methods. The result of such a program will be increased efficiency when the drilling industry is called on again to complete a large number of wells annually.

While the present outlook is not particularly bright, an underlying optimistic tone persists. Principal factor seems to be the certainty that the situation is temporary although little expression on the duration can be obtained.

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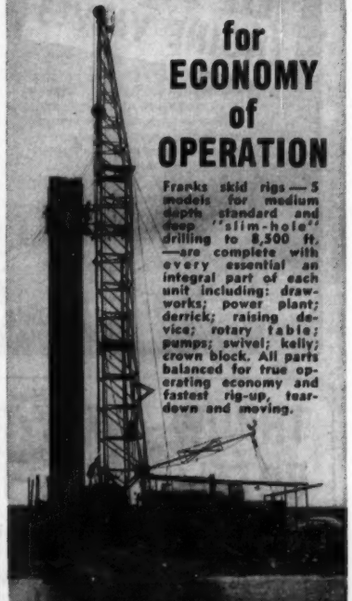
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A.I.M.E. Studies Oil's Part in War at Annual Meeting

(Continued from Page 12)

Emba, 4,500,000 bbl.; Central Asia, 6,000,000 bbl.; and Sakhalin, 3,250,000 bbl.

Those who are to address the domestic production symposium and the areas they will cover follow: A. M. Crowell, Arkansas Oil and Gas Commission, South Arkansas; V. H. Wilhelm, U.S. N.R., California; A. H. Bell, Illinois State Geological Survey, Illinois; Robert G. Reno, assistant state geologist, Indiana; W. A. Ver Weibe, University of Wichita, Kansas; Coleman D. Hunter, Kentucky-West Virginia Gas Co., Kentucky; J. Huner, Jr., state geologist, North and South Louisiana; H. M. Moore, Mississippi Oil and Gas Board, Mississippi; Frank C. Greene, Missouri; E. C. Reed, assistant state geologist, Nebraska; J. M. Kelly, New Mexico Oil Conservation Commission, New Mexico; C. A. Hartnagel, assistant state geologist, New York; Kenneth Cottingham, Ohio Fuel Gas Co., Ohio.

Raymond D. Sloan, Carter Oil Co., Oklahoma; A. C. Simmons, geologist and petroleum engineer, North and South Central Pennsylvania; John F. Galey, producer, South Pennsylvania; C. E. Shoenfelt, Rocky Mountain; Kendall E. Born, Tennessee Division of Geology, Tennessee; D. V. Carter, Magnolia Petroleum Co., East and East Central Texas; P. B. Leavenworth, Gulf Oil Corp., Texas Gulf Coast; Lewis McNaughton, De Golyer, McNaughton & McGhee, North Texas; G. W. Imholz, consulting geologist, North Central Texas; Henry Rogatz, geological engineer, Texas Panhandle; William H. Spice, Jr., South Central Texas; Michael T. Halbouty, consulting geologist and petroleum engineer, and James J. Halbouty, Texas University, South Texas; Taylor Cole, University Lands, and W. T. Schneider, Honolulu Oil Corp., West Texas, and David B. Reger, consulting geologist, West Virginia.

Concluding events on the Petroleum Division program are the economics session and the division banquet. E. A. Stephenson, retiring chairman of the division, will preside at the banquet and Ray L. Dudley, president of the Gulf Publishing Co., Houston, will speak on "Wanted: Petroleum Leadership." Several extraordinarily timely papers are on the economics session program at which L. F. Terry, Chase National Bank; William B. Case, Shell Oil Co., Inc., and D. F. Leary, Cities Service Co., will preside.

Exclusively war subjects which are to be discussed are the petroleum refining methods available to meet wartime demands by James Thornton, Lummus Co.; conservation by E. De Golyer, director of conservation, OPC; 100-octane gasoline, present and future, by Wright W. Gary, director of refining, OPC, and petroleum problems of the Axis powers by William B. Heroy, president, Pilgrim Exploration Co. Other economic papers are: "World Consumption of Petroleum," by V. R. Garfias, R. V. Whetsel and J. W. Ristori, Cities Service Co.; "Effect of Economic Influences on Oil Prices," by H. J. Struth, Texas Mid-Continent Oil and Gas Association; "Engineering Economics of Long Petroleum Pipe Lines," by Edgar G. Hill, Ford, Bacon & Davis, and "Investment in the United States Petroleum Industry," by John D. Gill and J. S. Weatherby, Atlantic Refining Co.

Mr. Struth's paper points out that even at the rate of 30,000 wells per year our average rate of discovery would not be sufficient to meet present needs and if drilling is reduced by half, our discoveries this year may be as low as 300 to 500 million barrels. This would be far from adequate since we must consider that current and prospective postwar needs demand finding at least three to four times as much new oil as was formerly considered adequate to maintain a normal uninterrupted supply.

Technology Session Hears of Progress in Many Fields

NEW YORK, Feb. 10.—As in the previous years the Petroleum Division's technology session of the annual A.I.M.E. meeting today brought forth some of the outstanding contributions of the year to the field of technical petroleum literature. A majority of the papers presented at this meeting are abstracted beginning on Page 42 of this issue. Other technical papers of direct interest to oil men are scheduled before the Geophysics Division Thursday.

In one of the latter, C. A. Heiland, head of the department of geophysics, Colorado School of Mines, speaks on the applications of geophysics in wartime, citing its use in the detection of hostile guns, sappers, planes, submarines, etc., as well as its direct uses. Speaking of petroleum, Dr. Heiland says: "In modern mechanized warfare, probably no single mineral is as important as petroleum. Not only is it indispensable as the source material for motor fuels and lubricants for the machines of war on land, at sea and in the air, but it plays an equally important role in many industries engaged in war production. The increased requirements for oil production can in the end only be met by an accelerated rate of new field discoveries; geophysics must be relied on more than ever to do its part in finding new oil deposits."

F. MacIntosh Galbraith, chief geologist, Falconbridge Nickel Mines, Ltd., pays tribute to the field of petroleum exploration wherein "geophysical methods of prospecting . . . have become solidly established" and he recommends similar work in the mining industry. Other geophysics session papers of interest to oil men are those by Hans T. F. Lundberg, Hans Lundberg, Ltd and N. B. Keevil, resident geophysicist, University of Toronto, on "Emanations Over Oil Fields and Ore Deposits and Possibilities of Geochemical Prospecting" and by J. Brian Eby, consulting geologist, and T. I. Harkins on "The Geophysical History of Darrow Dome, Ascension Parish, Louisiana."

E. A. Stephenson, professor of petroleum engineering, University of Kansas, and retiring Petroleum Division chairman, was chairman of the Petroleum Division technology session. W. S. Morris, field chairman of the East Texas Engineering Association, and W. H. Geis, geologist for Union Oil Co., were scheduled cochairmen. Speakers before the petroleum technology session were:

W. A. Bruce, Carter Oil Co., who presented a mathematical method of studying the pressure behavior of an oil reservoir as the fluids are withdrawn, showed how the behavior of a reservoir can be used to predict the future relationship between withdrawals and pressure and gave applications of the analysis to well-spacing problems.

H. H. Evinger and M. Muskat, Gulf Research & Development Co., who presented a method of calculating productivity factors for oil, gas and water systems in the steady state as an illustration of the quantitative application of the fundamental data on the flow properties of heterogeneous fluid systems.

Analyze East Texas Field

Resit Kenan and H. H. Power, of the University of Texas, who analyzed the performance of the East Texas field on the theoretical basis of compressible fluid flow to provide a solution to the problem of a much simpler nature than previously derived ones.

H. F. Winham, Shell Oil Co., Inc., who gave an engineering study of the Magnolia field in Arkansas, where intelligent development has increased the probable recovery from an originally estimated 455 bbl. per acre-foot to 555 bbl.

Charles Rodd, Gulf Oil Corp., who described the numerous factors involved in the relationship of various data to bottom-hole pressure and to well testing.

William Hurst, Core Laboratories, Inc., who presented a theory designed to make the volumetric balance equation more generally applicable to a study of oil reserves.

C. P. Parsons, Halliburton Oil Well Cementing Co., who reported that calipers are finding a definite place in the drilling of wells by eliminating a lot of guesswork in connection with the open hole for oil-well cementing, formation testing, gravel packing, etc.

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PIWC Committee Recommends Means for Increasing Reserves

(Continued from Page 11)

70 cents in the 1931-33 period, the number of dry holes drilled declined to 10,600, about 50 per cent of the 1924-26 rate.

An accelerated rate of small-well abandonments was noted by the committee in its analysis of figures through 1941, a year in which 10,700 wells were removed from the production list. During the past 5 years, the average rate of well abandonments was placed at 10,100. Individually, committee members reported off the record that small-well abandonments have accelerated since start of 1942, some of which would have been maintained on production for longer periods except for the incentives to salvage equipment for more profitable operations plus the rising producing costs.

Oppose Restrictions Against Abandonment

While recognizing the need of adequate prices as a means of keeping small wells in operation, the committee recommended against the imposition of restrictions against well abandonment. Speaking of prohibitions against the salvaging of material as a means of preventing the abandonment of wells, the report said:

"Such restriction would be artificial and would operate against normal economic forces and conceivably would withhold from oil-field supply markets materials which might possibly have been used in the finding elsewhere of considerable additional new oil reserves."

War restrictions, the committee conceded, may temporarily depress civilian consumption of petroleum, but increasing defense demands and the possibility that the United States may be required to supply most of the Allied requirements were held to be important offsetting factors.

Qualifications of the industry to increase exploratory effort were held to be adequate if the incentives to venture are sufficient. This conclusion was tied into evidence to support pleas for adequate crude-oil prices and continuance of the present depletion allowance. "In view of the present emergency," the committee concluded, "and in consideration of the downward trend of new discoveries against increasing demand, suggestions of the Treasury Department that percentage depletion be reduced are shortsighted and show a complete lack of appreciation of the imperative need to maintain the incentive to find new oil, which results from this provision. An increase in this allowance would be wiser overall governmental planning.

Extending Life of Small Wells

"Similar conclusions can be reached with respect to the problem of extending the life of marginal wells. Incentive provided by increased prices or anticipation of higher prices serves to encourage the operator to continue wells even after economic limit has been reached. Statutory percentage depletion allowance also serves to retard abandonment of these small wells."

The committee members were: O. D. Donnell, chairman, president, Ohio Oil Co., Findlay, Ohio; Frank Buttram, president, Independent Petroleum Association of America, Oklahoma City, Okla.; J. F. Drake, president, Gulf Oil Corp., Pittsburgh, Pa.; Walter S. Hallanan, president, Plymouth Oil Co., Charleston, W. Va.; William F. Humphrey, president, Tide Water Associated Oil Co., New York; John M. Lovejoy, president, Seaboard Oil Co. of Delaware, New York; Charles P. McGaha, Fain & McGaha, Wichita Falls, Tex.; Lawrence Vander Leck, Oil Producers Agency of California, Los Angeles, Calif.; and H. C. Wiess, president, Humble Oil & Refining Co., Houston, Tex.

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Industry War Council Prepares To Expand Activities

(Continued from Page 14)

the production-quota assignments indicated, however, that this issue is not permanently settled. The change that one faction advocated would remove reserves under stripper fields as one of the factors in the method of arriving at monthly production quotas.

Another warm discussion developed over the petroleum price-fixing schedule issued February 4 by OPA. There were several features to which oil men expressed their displeasure but the provision most severely criticized was that requiring the lowest quoted price for the ceiling. Operators pointed out that a range of prices on October 1 in many instances represented the differentials justified by some deficiency in specifications other than octane rating in the case of gasoline. Use of the low quotations of October 1, they argued, would actually become a penalty against companies manufacturing quality products.

Coordinator Ickes' remarks before the council, delivered in two installments, chiefly concerned 100-octane gasoline. He repeated previous requests that the petroleum industry solve this problem with all possible speed. He referred to seriousness of the war and said that aviation-fuel needs are expanding steadily. He was not criticizing but apparently was convinced that the industry needs to be impressed. Production of the hydrocarbons necessary to supply the industry's assignment of 400,000 tons of synthetic rubber was another point made in Coordinator Ickes' remarks.

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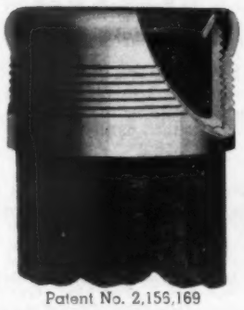

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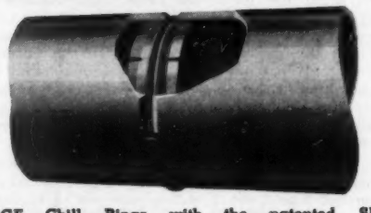

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Price Schedule 88—
Petroleum and Products

(Continued from Page 26)

seller concerning the production from the same well.

3. Where a well was a producing well on October 1, 1941, but did not actually produce any crude petroleum on that date, the maximum price for crude petroleum at such well shall be subject to Paragraph 4 (*ii*) (*a*) below, provided, that, however, where the price cannot be determined by this paragraph then the price shall be governed by Paragraphs 1 and 2 above.

4. Where a well was a shut-in well on October 1, 1941, and is subsequently reopened, or where a new well is completed subsequent to October 1, 1941, the maximum price at the well for crude petroleum produced from such well shall be determined as follows:

(*i*) Where there was only one purchase price posted as of October 1, 1941, for the pool in which the well is located, such posted price shall be the maximum price at the well for crude petroleum produced from the well in question.

(*ii*) Where there was more than one purchase price posted as of October 1, 1941, for the pool in which the well is located, and

(*a*) Where the location of the new or reopened well was included in the same lease with one or more producing wells on October 1, 1941, the posted price applicable to those producing wells on October 1, 1941, shall be the maximum price at the well for crude from the new or reopened well. (*b*) Where the above provision does not apply, the highest price posted as of October 1, 1941, for the pool in which the well is located shall be the maximum price at the well for crude from the new or reopened well.

(*iii*) Where there was no purchase price posted as of October 1, 1941, for the pool in which the well is located, a purchaser may set a temporary price for crude petroleum produced from the new or reopened well, subject to the provisions of Section 1340.154 above. This provision covers wells representing discovery and development of new pools subsequent to October 1, 1941.

5. The maximum prices for crude petroleum purchased at points other than at the well shall be at no greater differentials at such points over the maximum price for such crude at the well than existed on October 1, 1941.

(*b*) *Petroleum products.*

1. The maximum price on each product sold, contracted to be sold, delivered, or transferred by a seller shall be the lowest quoted price published in the first issue on or after October 1, 1941, of the National Petroleum News, Platts' Oilgram, or the Chicago Journal of Commerce, or other publications designated by this office, for a product of the same class, kind, type, condition and grade. Where such products are sold and prices are quoted on a delivered basis, then the maximum delivered price shall be the lowest quoted delivered price so published. Where products are sold and prices are quoted on an f.o.b.-shipping-point basis, then the maximum f.o.b. price shall be the lowest quoted f.o.b. price so published.

2. Where the maximum price for a petroleum product at a given shipping or delivery point cannot be determined under Paragraph 1 above, the maximum price for each seller at such shipping or delivery point shall not exceed the price charged at that point by him on the last sale of a substantial quantity of the same product within 60 days prior to October 15, 1941. Where the product is sold on a delivered basis at a given point the maximum price shall be the price charged on the last sale of a substantial quantity of the same product made on a delivered basis at that point in the period specified. Where the product is sold at a given point on an f.o.b.-shipping-point basis, the maximum price shall be the price charged on the last f.o.b.-shipping-point sale at that point of a substantial quantity of the same product in the period specified.

3. Where the maximum price for products at a given shipping or delivery point cannot be determined under Paragraph 1 or 2 above, sellers may sell such products at the market price prevailing at that point on October 1, 1941.

(*c*) *Specific prices.* — The following specific prices shall be the maximum prices for the items named at the points enumerated, notwithstanding Paragraphs (*a*) and (*b*) above:

1—CRUDE PETROLEUM

Pennsylvania Grade. — The maximum prices at the well for Pennsylvania Grade crude petroleum shall be those established in Price Schedule 22[1]—Pennsylvania Grade Crude Oil (Sections 1340.21 to 1340.29 of this chapter).

North and North Central Texas and Oklahoma.—The maximum price at the well for crude petroleum of 40° gravity and above, determined by the American Petroleum Institute method, produced in Archer, Baylor, Brown, Callahan, Clay, Coleman, Comanche, Cooke, Eastland, Fisher, Foard, Haskell, Jack, Jones, Montague, Palo Pinto, Shackelford, Stephens, Taylor, Throckmorton, Wichita, Wilbarger, and Young counties, Texas, and in the bed of the Red River in Tillman County, Oklahoma, shall be $1.21 per barrel with the customary differentials for lower-gravity crudes.

Louisiana. — The maximum price at the well for crude petroleum of 40° gravity and above, determined by the American Petroleum Institute method, produced in the Caddo pool in Louisiana shall be $1.20 per barrel with the customary differentials for lower gravity crudes.

Oklahoma.—The maximum price at the well for crude petroleum of 40° gravity and above, determined by the American Petroleum Institute method, produced in Carter County and in the Healdton and Oscar pools in Oklahoma shall be $1.25 per barrel with the customary differentials for lower-gravity crudes.

2—GASOLINE

Maximum Prices for Cargo Transactions on the Gulf Coast Market

The maximum price on sales by the refiners listed below and their subsidiaries for cargo transactions on the Gulf Coast market shall be as follows:

Motor gasoline:	Cents/ gallon
Minimum 80-octane 1939 research method (as determined by Cooperative Fuel Research Committee) with a maximum of 2 c.c. of lead	6.00
60-62 gravity, maximum 400 end point:	
72-74 octane leaded	5.75
70 octane unleaded	5.75
68 octane unleaded	5.75
65 octane unleaded	5.25
60 octane unleaded	5.00

(Octane ratings as defined by American Society for Testing Materials.)

Atlantic Refining Co., The
Cities Service Co.
Consolidated Oil Corp.
Continental Oil Co.
Gulf Oil Corp.
Humble Oil & Refining Co.
Mid-Continent Petroleum Corp.
National Refining Co.
Ohio Oil Co., The
Pan American Petroleum & Transport Co.
Phillips Petroleum Co.
Pure Oil Co., The
Shell Union Oil Corp.
Skelly Oil Co.
Socony-Vacuum Oil Co., Inc.
Standard Oil Co. of California
Standard Oil Co. (Indiana)
Standard Oil Co. (New Jersey)
Sun Oil Co.
Texas Co., The
Tide Water Associated Oil Co.

Maximum prices to be charged by other petroleum refiners for cargo transactions on the Gulf Coast market shall be as follows:

Motor gasoline:	Cents/ gallon
Minimum 80-octane 1939 research method (as determined by Cooperative Fuel Research Committee) with a maximum of 2 c.c. of lead	6.5
60-62 gravity, maximum 400 end point:	
72-74 octane leaded	6.25
70 octane unleaded	6.25
68 octane unleaded	6.25
65 octane unleaded	5.75
60 octane unleaded	5.5

(Octane ratings as defined by American Society for Testing Materials.)

Maximum Prices for Gasoline on the Eastern Seaboard

Eastern seaboard. — (Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, West Virginia.) The maximum prices for all sales of all motor gasoline sold in the eastern-seaboard area shall not be in excess of 0.3 cent per gallon above the prices in the above states and the District of Columbia on November 7, 1941. Such maximum increase of 0.3 cent per gallon shall apply to the communities in Maryland and Virginia adjacent to the District of Columbia in addition to the increase provided for those communities below.

Maximum Tank-Wagon Prices, Excluding Taxes

(In cents per gallon)

Col (1), Dealer. Col. (2), Consumer or commercial.

Tank-wagon area—	Third grade (1)	Third grade (2)	Regular grade (1)	Regular grade (2)	Premium grade (1)	Premium grade (2)
Iowa:						
Des Moines	9.4	10.4	9.9	11.4	11.4	13.4
Ohio:						
Geneva	9.5	12.0	9.5	12.0	11.0	14.0
Wisconsin:						
Lodi	10.1	11.1	10.6	12.1	12.1	14.1
Madison	9.9	10.9	10.4	11.9	11.9	13.9
Mazomanie	9.9	10.9	10.4	11.9	11.9	13.9
Sauk City	10.1	11.1	10.6	12.1	12.1	14.1
Stoughton	9.9	10.9	10.4	11.9	11.9	13.9
Sun Prairie	10.1	11.1	10.6	12.1	12.1	14.1

Maryland and Virginia: The maximum tank-wagon prices for those communities in Maryland and Virginia adjacent to the District of Columbia shall be not more than 0.5 cent per gallon in excess of the highest price between December 15, 1941, and December 31, 1941, where suppliers had been making allowances of 0.5 cent per gallon or more between December 15, 1941, and December 31, 1941.

3—FUEL OIL

Maximum Tank-Wagon Prices for No. 2 Fuel Oil

Tank-wagon area—	Cents/ gallon
Washington, D. C.	7.6

Maximum Prices for Bunker C and No. 6 Grade Fuel Oil

Gulf and East coasts. — The maximum prices for Bunker C and No. 6 grade fuel oils on the Gulf and East coasts shall be those established in Price Schedule 72[2]—Bunker C and No. 6 Grade Fuel Oils, East and Gulf Coasts Sections 1340.101 to 1340.109 of this chapter).

4—LUBRICANTS

Maximum Prices f.o.b. Refinery for Pennsylvania Grade Neutral Stocks

(In cents per gallon)

Viscous neutrals—No. 3 color viscosity at 70° F.

200 viscosity (180 at 100°) 420-425 flash point

0 pour test	40.5
10 pour test	39.5
15 pour test	38.5
25 pour test	33.0

150 viscosity (143 at 100°) 400-405 flash point

0 pour test	38.5
10 pour test	37.5
15 pour test	36.5
25 pour test	31.0

[1] 6 F.R. 4324.

[2] 7 F.R. 398.

AMENDMENT

Amendment 2 to Price Schedule 88—Petroleum and Petroleum Products

Section 1350.151 is amended to read as set forth below. Section 1340.159 is hereby amended as follows: Subparagraph (*b*) (2) is amended and Subparagraphs (4), (5) and (6) are added to (*b*) as set forth below.

1340.151 *Maximum prices for petroleum and petroleum products.*—On and after February 2, 1942, regardless of the terms of any contract of sale or purchase, or other commitment, except as provided in Section 1340.159, no person shall sell, offer to sell, deliver or transfer petroleum or petroleum products, and no person shall buy, offer to buy, or accept delivery of crude petroleum at prices higher than the maximum prices set forth in Appendix A hereof, incorporated herein as Section 1340.159.

1340.159 Appendix A. *Maximum prices for petroleum and petroleum products.*

(*b*) *Petroleum products.*

(2) Where the maximum price for a petroleum product at a given shipping or delivery point cannot be determined under (1) above, the maximum price for each seller at such shipping or delivery point shall not exceed the price charged at that point by him on the last sale of a substantial quantity of the same product within 60 days prior to October 15, 1941. Where the product is sold on a delivered basis at a given point the maximum price shall be the price charged on the last sale of a substantial quantity of the same product made on a delivered basis at that point in the period specified. Where the product is sold at a given point on an f.o.b. shipping point basis, the maximum price shall be the price charged on the last f.o.b. shipping point sale at that point of a substantial quantity of the same product in the period specified.

(4) Notwithstanding (1), (2) and (3), where contracts covering domestic sales of petroleum products had been made prior to November 10, 1941, the prices in such contracts may be charged pursuant to such contracts up to and including March 1, 1942.

(5) Notwithstanding (1), (2) and (3), where contracts covering export sales of petroleum products had been made prior to January 20, 1942, the prices in such contracts may be charged pursuant to such contracts up to and including March 1, 1942.

(6) Notwithstanding (1), (2) and (3), sales of petroleum products may be made up to and including March 1, 1942, under the following provisions:

(*i*) The maximum price on each product sold, contracted to be sold, delivered, or transferred by a seller shall be the lowest quoted price published in the first issue after November 7, 1941, of the National Petroleum News, Platt's Oilgram, or the Chicago Journal of Commerce, for a product of the same class, kind, type, condition and grade. Where such products are sold and prices are quoted on a delivered basis, then the maximum delivered price shall be the lowest quoted delivered price so published. Where products are sold and prices are quoted on an f.o.b. shipping point basis, then the maximum f.o.b. price shall be the lowest quoted f.o.b. price so published.

(*ii*) Where the maximum price for products at a given shipping or delivery point cannot be determined under (*i*) above, sellers may sell such products at the market price prevailing at the time of the sale, providing, however, that notice of such price and sale is furnished to this Office within 10 days after such sale.

(Executive Orders 8734, 8875, 6 F. R. 1917, 4483.)

This amendment No. 2 shall become effective February 2, 1942. Issued this 7th day of February, 1942.

MISSISSIPPI AND SOUTHEAST

Tinsley Drilled Up and No Activity in Prospect

By R. MARNE SANFORD

JACKSON, Miss.—Not since prior to the discovery of the Tinsley field in Mississippi has the general oilfield activity been at such a low as now prevails throughout the state. The decline of activity has been decidedly sharp and all within the past month and a half.

The total number of completions in the state for the last month of 1941 or for December was 30, and of this number there were 24 oil wells. During the immediately past month or January of 1942 there were only eight completions registered in the entire state of which six were oil wells. The past week saw only one oil well completed which is the first for the month of February. As is generally recognized throughout the state, though, not even a goodly portion of this decline can be laid to the materials scarcity and the spacing rules of late. There is also the fact that little proven area is left undrilled in the state. Probably unless better results are obtained than are at present indicated at Phillips' test in the new Pickens-Sharpsburg field, development of this area will be greatly slowed down.

The Phillips' operation is 1 Gene, a southeast offset to the Morgan discovery well of late in 1941. It is still testing and attempting to shut off water at 4,849-60 ft. Only when flowed by heads after being closed in for a number of hours, has the well made any volume of oil, and this only to the extent of 40 per cent oil along with 60 per cent salt water.

MISSISSIPPI COMPLETIONS

Wildcats

Marshall County: W. B. Fly 3 Tucker, NE NE 20-5s-4w, location abandoned.

Fields

Tinsley, Yazoo County: E. C. Johnston 5 Martin, NW NW 1-9n-3w, top Woodruff 4,975 ft., T.D. 4,996 ft., pumped 300 bbl. daily.

Rocky Mountain Runs

Production for week ended February 7, 1942:

MONTANA

Kevin-Sunburst	4,500
Border	30
Cat Creek	430
Cut Bank	14,610
Dry Creek	410
Pondera	780
Total Montana	20,760

WYOMING

	Barrels
Salt Creek	14,870
Big Muddy	1,120
Badger Basin	140
Black Mountain	60
Byron	4,080
Cody Dome	40
Cole Creek	1,040
Dallas Derby	260
Dutton Creek	60
East Mahoney-Ferris	130
Elk Basin	750
Frannie	3,290
Garland	1,480
Grass Creek	1,780
Hamilton Dome	610
Hidden Dome	70
Hudson	300
Iron Creek	20
La Barge	2,300
Lance Creek	21,540
Lost Soldier	8,460
Mahoney	1,120
Maverick Springs	2,630
Medicine Bow	720
Mule Creek	340
Oregon Basin	9,360
Osage	600
Poison Spider	190
Quealy Dome	470
Rex Lake	30
Rock River	2,800
South Casper Creek	500
Teapot	10
Warm Springs	70
Wertz	6,950
Total Wyoming	88,190

NEW MEXICO

Arrowhead	4,400
Cooper	3,120
Corbin	30
Eaves	930
Eunice	19,790
Halfway	400
Hardy	1,960
Hobbs	10,920
Jal	380
Langlie	3,790
Lynch	460
Lynn	1,120
Maljamar	6,050
Mattix	3,870
Monument	20,900
North Lynch	20
Penrose	3,100
Rhoades	490
Salt Lake	260
Skaggs	70
Skelly	1,770
South Eunice	2,790
South Lovington	1,700
South Maljamar	200
Vacuum	14,550
West Eunice	610
Artesia area	16,740
Aztec-Bloomfield	10
Hogback	200
Rattlesnake	260
Table Mesa	90
Total New Mexico	120,980
Total Colorado	6,640
Total Rocky Mountain region	236,570

LEGAL

OIL AND GAS LEASE

United States Department of Agriculture, Forest Service, Muskegon, Michigan, January 30, 1942. Sealed bids in triplicate will be received until 10:00 A.M. Eastern Standard Time, March 9, 1942, and then publicly opened, offering bonus for operating rights in connection with gas and oil leases on land located in the State of Michigan, Oceana County, Greenwood Township, T 13 N, R 15 West, Michigan Meridian, Section 30: S½ NW; NW SW. Award of lease will be made only to bidder who can show sufficient experience and financial resources and prove citizenship. Interested parties may obtain bid documents, lease forms and operating regulations from the Forest Supervisor, Forest Service, Muskegon, Michigan.

Canadian Fields

(Continued from Page 73)

were disclosed, of which the more westerly showed the most promising indications. In the Wawa area, between Jasper and Red Deer, several structures of sufficient extent and closure to be potential oil fields were outlined, and the folds are believed to have cores of oil-bearing limestone. One structure, several miles east of the Home-Brazeau well, indicated good possibilities at depths varying from 6,000 to 9,000 ft.

30 YEARS IS A LONG TIME!

Taft was president, Peary had just discovered the North Pole, Arizona admitted to the Union as the 48th state and the famed steamship Titanic sunk on its maiden voyage by an iceberg.

That was over 30 years ago, when Mr. H. C. Brewster founded the present company in a little shop in Oil City, Louisiana.

We've seen a lot of changes in the meantime. Space has been annihilated with the radio, men have taken to wings, automobiles have become faster, and oil wells have become deeper. During all this time it has been the Brewster policy to keep our sights aimed at the future and bend every effort to make constantly improved drilling equipment capable of handling tomorrow's requirements.

Brewster's reputation as a manufacturer of fine oil field equipment stands as a reward for our foresightedness in engineering and metallurgy.

The drilling fraternity's confidence in Brewster drilling equipment will always be guarded as a sacred trust. The name Brewster always has and always will stand as a hallmark of quality.

We're looking forward to the next thirty years.

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Personal Paragraphs

R. A. BROOMFIELD, Jr., has resigned as vice president of Barnsdall Oil Co., and will take a well-earned rest of several weeks before reentering the oil business.

HARRY LEYENDECKER, chief scout for Tide Water Associated Oil Co., Houston, Tex., has resigned to accept the post of senior petroleum development analyst in District 3, Division of Production of the Office of the Petroleum Coordinator, with headquarters at Houston. R. C. POWLESS has been appointed chief scout to succeed Mr. Leyendecker.

F. JULIUS FOHS, president of the Fohs Oil Co., Houston, Tex., is on an extended business trip to the East Coast.

G. H. BLANKENSHIP, independent oil operator, Centralia, Ill., has been appointed coordinator of defense measures for the oil industry in Marion County.

H. W. BENISCHEK, petroleum engineer for the Texas Co., has been transferred from the company's Pampa, Tex., office to Fort Worth, Tex.

H. H. COLLETON, formerly chief gager, Stanolind Oil & Gas Co., Ada, Okla., has been promoted to district foreman, Stanolind Pipe Line Co., Wink, Tex.

CASPER T. OIEN, producer in the Kevin-Sunburst field and M. R. WAGNER, producer and contractor in Cut Bank, Mont., have been appointed to the Montana Oil Conservation Board by Gov. Sam Ford.

AL W. CONOVER, who was president and general manager of the Oklahoma Utilities Co. from 1930 to 1935, and who left Bristow, Okla., to take over the management of utilities in Colorado at that time, is now president and general manager of the North Shore Gas Co., of Chicago.

MAJ. A. N. HORNE, U. S. Infantry, is on duty at Washington, D. C., where he is stationed at the War College of the Army; it is reported that he will be concerned with matters of transportation and supply. He has recently gone into the service from the position of manager of Empire Pipe Line Co., Bartlesville, Okla.

W. S. ACKERMAN, Tide Water Associated Oil Co., and EARL WAGY, Standard Oil Co. of California, were in Los Angeles last week attending a committee meeting but have returned north to their respective offices.

W. S. ZEHRUNG, president, Pennzoil Co., was elected chairman of the Associated Petroleum Industries of Pennsylvania at the annual meeting of the organization in Philadelphia. He succeeds SAMUEL MESSER, Quaker Oil Co., who served for a number of years. Mr. Messer was named to the executive committee.

F. W. LAWTON, engineer in the refinery department of the Texas Co., Houston, Tex., has been transferred to the engineering department at New York.

EVERET M. GRAY, who is starting his fourteenth year with General Petroleum Corp. in California, has been promoted to the post of sales manager for the Bakersfield district, succeeding Graham Hornbeck, who died recently.

JERRY CHESSNUT, formerly in charge of the West Texas-New Mexico office of American Republics Corp. at San Angelo, Tex., has been made general superintendent of the consolidated San Angelo-San Antonio offices, now concentrated at San Angelo. C. E. EDGERTON, of Houston, Tex., now moved to San Antonio, will serve both areas as geologist.

HOWARD PYLE, Union Oil Co., has been elected chairman of the allocation committee, a subcommittee of the Conservation Committee of California Oil Producers, succeeding W. C. WHALEY, of Barnsdall Oil Co., who recently resigned in order to devote his entire time to the main committee. RICHARD FENTON, of the Stripper Well Association, has succeeded L. L. AUBERT, who resigned from the allocation committee for the same reason as Mr. Whaley.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

State Sen. Sam Bradley of Owensboro, Ky., is now an oil producer, having brought in a big well at Olympia.

Tenderfeet claim to have discovered an oil pool between the city of Los Angeles and Long Beach, a fashionable coast resort. They have taken up three big leases which were promptly transferred to the Great St. Helen's Petroleum Co., an English corporation.

Precautions have been taken at the refineries of both the Texas Co. and the Gulf Refining Co. to safeguard the properties against possible damage from the war menace.

20 YEARS AGO

According to F. Julius Fohs, who located the Mexia producing area, 16 structures have been defined in the Mexia district on which the Humphreys-Pure Oil interests hold 60,000 acres.

Joseph B. Elam has been named secretary of the Louisiana branch of the Texas-Louisiana division of the Mid-Continent Oil and Gas Association.

Mr. and Mrs. David F. Connolly of Tulsa left on Tuesday for California where they will make a 3 weeks' stay after which Mr. Connolly will take up his duties in an executive capacity with the Texas Co. in New York.

Edward S. Dorrance, 79, one of the oldest members of the oil fraternity in the United States, died recently at Arkansas City, Kans. He had been actively engaged in the oil business for more than 55 years.

10 YEARS AGO

Robert G. Stewart, president of the Pan American Petroleum & Transport Co., was the chief spokesman against the tariff on oil before the Ways and Means Committee at Washington, D. C.

Daniel Weller of Baton Rouge, La., who retired as president of the Standard Oil Co. of Louisiana on January 1, was found dead in his brother's home in New Rochelle, N. Y., February 6. He had been in ill health for some time.

ROY E. DOSSER, Sinclair Prairie Oil Co., has joined the gas-measurement department, as engineer.

W. C. LENZ, petroleum engineer for the Texas Co., has been transferred from Fort Worth, Tex., to Midland, Tex.

OSCAR HATCHER, geologist of Ada, Okla., has moved to Tulsa as subsurface geologist for Kansas, Oklahoma and Texas area of Mid-Continent Petroleum Corp.

A. TORY PETERSON, general bookkeeper and cashier of United Natural Gas Co., Oil City, Pa., has retired from active duties after nearly 27 years of continuous service with the company.

RALPH THOMAS, geologist for Inland Gas Corp. at Ashland, Ky., has received a call to report for duty at Fort Sam Houston, San Antonio, Tex. Mr. Thomas, a reserve officer, has held the rank of second lieutenant of infantry.

MILLARD T. KIRK, associated with the natural gas and gasoline department, Phillips Petroleum Co., Bartlesville, Okla., has retired and moved to Norman, Okla. He has been associated with this company for 22 years and has been engaged in the oil and gas business for 40 years.

S. T. MILLER, engineer, Stanolind Pipe Line Co., Skiatook, Okla., has retired. In 1915 he became associated with John T. Milliken Co., continuing with the Harry F. Sinclair interests when the latter took over the Milliken company in 1916, and with Stanolind, which succeeded the Sinclair ownership.

VERNON RAY SMITH, formerly petroleum engineer, British American Oil Co. at Sabine Pass, Tex., has been commissioned an ensign in the U. S. Naval Reserve, Eighth Naval District.

DONALD M. CAMERON, district sales manager, Burbank, Calif., has been appointed manager of foreign and general sales, Union Oil Co., Los Angeles, Calif. He replaces J. B. ARTHUR, retired.

B. E. PHILLIPS, land man for Sinclair Prairie Oil Co., has been transferred from Tyler, Tex., to Fort Worth, Tex. He replaces CAPT. GEORGE S. BERRY, JR., who has been called to active duty.

JOHN W. GILLILAND has retired as president of the General American Oil Co., Dallas, Tex., but will continue to operate as an independent producer. A. H. MEADOWS, vice president, succeeds him as president of the company.

EARL B. NOBLE, chief geologist, Union Oil Co. of California, addressed the members of the Houston Geological Society at its weekly meeting last Thursday. Mr. Noble is also vice president of the American Association of Petroleum Geologists.

H. H. BRADFIELD, paleontologist for the Texas Co., addressed the members of the North Texas Geological Society at their meeting in Wichita Falls, Tex. Mr. Bradfield spoke on "Pennsylvanian Stratigraphy and Correlations in North Texas."

JOHN T. HAYWARD, chief petroleum engineer, Barnsdall Oil Co., Tulsa, has been relieved of his duties in that capacity to devote his full time to Barnsdall Research Corp., of which he is a vice president. KENNETH W. HALEY, engineer, has been promoted to chief petroleum engineer to succeed Mr. Hayward.

Navy Calls Californian

Harry Phillip Stolz, partner in the Los Angeles, Calif., firm of Stanley & Stolz, consulting engineers and geologists, and new chairman of the Petroleum Division of the American Institute of Mining and Metallurgical Engineers, is now serving his country for the second time in war. That fact explained his absence from the annual meeting this week in New York.

HARRY PHILLIP STOLZ

As a lieutenant commander, Mr. Stolz was called to active duty in June 1941 by the U. S. Navy and assigned to the Office of Inspector of Naval Petroleum Reserves in California as assistant inspector. During the World War, Mr. Stolz gave up his studies at Stanford University to enter the U. S. Army as a second lieutenant of infantry. He was commissioned a lieutenant in 1918 and was discharged in January 1919. Mr. Stolz retained his interest in the service with membership in the Army Reserve until 1938 when he resigned as captain to accept a Naval Reserve commission.

The new Petroleum Division chairman was born in San Francisco, Calif., January 29, 1899. He attended schools there, preparing for entrance into Stanford University in 1917 at the California School of Medical Arts. Following his service with the Army he returned to Stanford in 1919 for undergraduate and graduate study. He and his family now live in La Canada, Calif.

Since 1923 Mr. Stolz has been associated with the California oil industry and 11 years ago entered into partnership with E. R. Stanley under the firm name of Stanley & Stolz, consulting engineers and geologists.

Mr. Stolz has long taken an active interest in the work of the A.I.M.E. In 1939 he was elected to the office of chairman of the southern California chapter and last year served as vice chairman of the Petroleum Division of the institute.

A. P. CALLAHAN, junior petroleum engineer for the Texas Co., has been transferred from Buckeye, N. M., to the Pampa, Tex., office of his company.

CHARLES SCHOCK, district land man for Stanolind Oil & Gas Co., Midland, Tex., has been transferred to Amarillo, Tex., to succeed O. N. GAMMEL, who recently was transferred to San Antonio, Tex.

C. B. MAPES, general secretary, Mid-Continent Oil and Gas Association, discussed the cooperative work being carried on by the association in a speech before a recent meeting of the Tulsa Bar Association.

MAX W. BALL, president, Abasand Oils, Ltd., Waterways, Canada, has been elected chairman of the Northern Alberta branch of the Canadian Institute of Mining and Metallurgy which met recently at Edmonton, Alta.

D. V. EELLS, assistant superintendent of the Ponca City, Okla., refinery of the Cities Service Oil Co., said he had "mixed" feelings as he gave his daughter, Donna, in marriage Saturday to become Mrs. John Woodside. John is also a Cities Service employe.

J. J. JOHNSON, chairman of the board of directors, Johnson Oil Refining Co., Chicago, has been elected president, succeeding I. H. Johnson, who recently died. G. G. LILLY, secretary, also has been elected vice president, and SEYMOUR DEXTER, assistant secretary, has been made secretary.

RUSSELL S. KNAPPEN, assistant to the vice president and general manager of the Gulf Oil Corp., Gypsy Division, and Gulf Refining Co. of Tulsa, was guest speaker at the weekly meeting of the Fort Worth Geological Society. Mr. Knappen served in World War I as the chief geologist from the Second U. S. Army and spoke on "Military Geology."

W. E. GREENMAN, formerly located in the geological department of the Texas Co. at Houston, Tex., has been transferred to Corpus Christi, Tex., as district geologist.

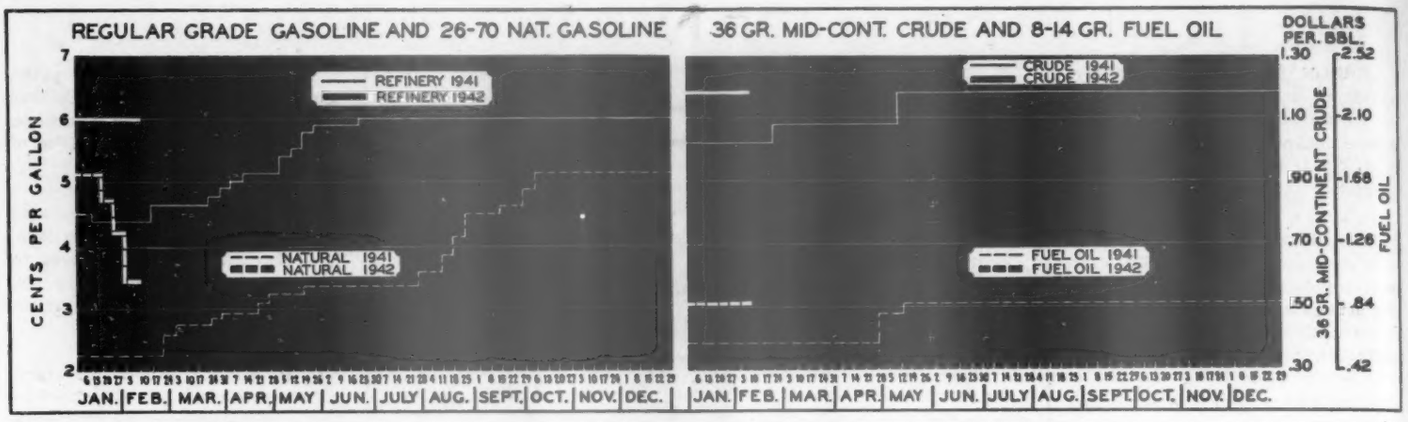
WILLIAM W. PORTER, Los Angeles consulting geologist, discussed "Relation of Geology to Current Problems," at the February meeting of the California Natural Gasoline Association held in Los Angeles a few days ago. WILLIAM MOELLER, JR., of Southern California Gas Co. and chairman of District 5 natural gas and gasoline committee, addressed the gathering.

Shifts: MARK D. JACKMAN, superintendent, Bert Fields, Carmi, Ill., to Mount Vernon, Ill.; FRANK S. CASEY, superintendent, Gulf Pipe Line Co., Connersville, Ind., to Galesburg, Ill.; A. W. REA, superintendent, J. V. Dunbar, Flora, Ill., to Sims, Ill.; PATRICK A. TRAPP, president, Butte Oil Co., Chicago, Ill., to Butte, Mont.; JOSEPH A. HEALY, manager, Belcher Producing Co., Santa Monica, Calif., to Miami, Fla.; C. G. ADAMS, JR., geologist, Texas Co., Colby, Kans., to Dodge City, Kans.; W. G. HORSTMAN, superintendent, Plantation Pipe Line Co., Meridian, Miss., to Baton Rouge, La.; HENRY PEAK, superintendent, Cities Service Oil Co., Drumright, Okla., to Oklahoma City, Okla.; J. W. WILLIAMS, superintendent, Falcon-Seaboard Drilling Co., McAllen, Tex., to Houma, La.; JAMES A. CLAY, JR., engineer, Stanolind Oil & Gas Co., Tulsa, to Odessa, Tex.; G. L. KINCAID, superintendent, Swain-King Oil Co., Salem, Ill., to Flora, Ill.; J. F. O'SHAUGHNESSY, vice president, Lario Oil & Gas Co., Wichita, Kans., to Miami Beach, Fla.; R. W. BLACKBURN, engineer, Continental Oil Co., Opelousas, La., to Ville Platte, La.; LEWIS H. THORNTON, president, Thornton Co., Wellsville, N. Y., to Palm Beach, Fla.; W. O. LOFTIS, superintendent, Kruger Drilling Co., Wewoka, Okla., to Athens, Tex.; H. W. VENSEL, president, Harland Oil Co., Pacific Palisades, Calif., to Wolco, Okla.

T. G. MARKLEY and A. J. BANKHEAD, independent operators of Lake Charles, La., have moved their offices to Houston, Tex., where they will operate as Markley-Bankhead, Inc.

GEORGE SAWTELLE, president and general manager of the Kirby Petroleum Co., Houston, Tex., was reappointed chairman of the Houston Chamber of Commerce water-supply committee.

M. C. VAN GUNDY, Texas Co., Houston, Tex., has been elected chairman of the southeastern Texas section, American Chemical Society. G. R. GRAY, Humble Oil & Refining Co., Houston, Tex., has been elected chairman-elect; L. M. BLENDERMAN, Texas Co., Port Arthur, Tex., vice chairman; E. P. DOREMUS, JR., Shell Oil Co., Inc., Houston, Tex., secretary-treasurer; R. H. PRICE, Pan American Refining Co., Texas City, Tex., A. J. HARTSOOK, Rice Institute, and I. S. CLIFF, Shell Oil Co., Inc., Houston, Tex., councillors.



MARKET DEVELOPMENTS . . .

East Coast

NEW YORK, Feb. 10.—With fears of reduced gasoline consumption as a result of tire rationing allayed by reports on January demand, the attention of the East Coast industry centered almost exclusively on the problem of supply. A summary of preliminary reports of January consumption indicates an increase of around 10 per cent with rising demand in the latter part offsetting comparatively low demand earlier. This presages continued high requirements in February and even conservative economists are inclined to look for increased consumption at least through the first quarter.

Demand for all products continues high and despite the use of tank cars, which are now supplying close to 10 per cent of all East Coast requirements, stocks continue to decline. The decline of 1,900,000 bbl. in stocks of gasoline and fuel oil in the last week of January, however, was about 25 per cent less than in the preceding 2 weeks, indicating that the resort to alternative transportation methods is proving effective.

As a result of this steady decline in stocks, the price structure remains very firm and reductions on the Gulf Coast have let East Coast prices remain unaffected. The recent advances in motor-fuel prices are well sustained and the hope is expressed that similar advances in kerosene and fuel oil will be permitted. This hope has been heightened by the increase in the volume of products shipped into the northeastern marketing area by rail with resultant higher over-all costs.

Pennsylvania lubricating oils are also reported much stronger. Early buying of bright stocks is apparently under way and demand for neutral is reported strong. Sales of bright stock are reported to be all at a minimum of 25 cents while some refiners are asking 28 cents on 25-pour material. Normal additions to inventories have been impossible and Pennsylvania neutral stocks are said to be off one-third from a year ago while ample supplies of bright stock are available.

Mid-Continent

PROSPECTS of shipping natural gasolines by pipe lines to the East Coast replacing crude oil that might be cut off by curtailment of production in several Mid-Continent states are offering a ray of hope for relief from the present depressed natural-gasoline market. With the threatened shortage of petroleum on the East Coast due to transportation difficulties in supplying needs out of the Gulf Coast, increasing use is expected to be made of natural gasolines that can be shipped by pipe lines with crude from the Mid-Continent. Manufacturers point out that natural gasolines will insure the most effective utilization of pipeline capacity in augmenting the supply of gasolines on the East Coast during the emergency.

In the meantime the natural-gasoline market continues extremely sluggish due to greatly slackened sales and movement to Gulf Coast refiners, and prices suffered further sharp reductions of as much as 0.75 cent per gallon, Further revisions on the downward side are anticipated. Gasoline manufacturers attribute the slow demand to market complications that have arisen indirectly from recent orders of the state Railroad Commission of Texas that the production of certain designated fields in that state be used only if the maximum amount of aviation stock gasoline is recovered. It is pointed out that the production of many of these designated fields is "border-line" crude with only relatively small recoveries of high-octane gasoline suitable for aviation stock. This leaves a refiner with an extra-large yield of a very low octane material. Refiners do not have sufficient lead supplies to build up the octane to marketable requirements, and as the product cannot be built up with natural gasoline alone, there is no occasion to buy any naturals. At the same time, as lend-lease specifications do not permit the use of any lead, the product cannot be sold for that purpose.

Refinery gasolines also continue to back up with demand feeling the effect of tire and automobile rationing to an increasing extent. Price concessions are being offered freely in all grades, including natural gasolines.

Kerosene and light distillates and heating oils also are easing off. It is getting a little late in the season for these products and inquiries now are shifting more to tractor distillates and heavier fuels. Generally, however, prices showed little change.

Sentence Summaries

MID-CONTINENT: Natural gasolines sluggish. Weakness spreads. Prices slip.

EAST COAST: Demand for all products high. Supplies decline with transportation upset.

GULF COAST: Slow movement backs up products. Kerosene eases.

PACIFIC COAST: Fuel-oil demand continues good. Gasolines slow.

PENNSYLVANIA: All products firm. Prices unchanged.

A.P.I. REFINERY REPORT

(Figures in thousands of barrels)

(Week ended January 31, 1942)

	Dly. crude runs to stills	Stocks Gasoline	Residual	Gas oil
East Coast	618	19,536	8,789	13,400
Appalachian	160	3,799	505	375
Ind., Ill., Ky.	696	20,392	4,210	3,845
Okla., Kans., Mo.	329	9,194	2,108	1,040
Inland Texas	180	3,409	1,321	121
Texas Gulf	1,033	17,158	9,295	7,882
Louisiana Gulf	168	4,395	2,197	1,513
No. La. and Ark.	79	877	361	61
Rocky Mountains	93	2,137	624	312
California	492	16,915	61,779	12,125
Total Jan. 31, 1942	3,848	97,810	91,189	40,674
Total Jan. 24, 1942	3,885	96,363	92,079	41,863
Total Feb. 1, 1941	3,660	90,366	98,097	37,933

Note: Total refinery runs and product stocks for week ended February 7, 1942, appear on Trends page.

CRUDE-OIL STOCKS

(Bureau of Mines Estimate)

Week ended:	Bbl. of crude*
January 31, 1942	250,740,000
January 24, 1942	248,164,000
February 1, 1941	281,270,000

*Excludes heavy, unrefinable crude in California.

Gulf Coast

HOUSTON, Tex., Feb. 10.—With stocks of major refined products reported to be the highest in several months, the Gulf Coast refinery market the past week entered a critical stage, which is generally expected to become more grave unless there is some improvement in the transportation situation, the chief concern of most refiners. There was practically no movement of any material the past week except lend-lease which was said to have picked up slightly. Lend-lease movement was sufficient to relieve the situation. Most spot inquiries for material were being turned down due to the lack of tankers. Several spot sales were reported, but sellers were unable to move the material.

For the time being most refiners are in fair shape so far as storage is concerned, but it is doubtful if they can operate for any length of time under present conditions before it will become necessary to reduce pipe-line runs.

Kerosene, which has been the only product showing firmness, gave signs of weakness as one sale of 60,000 bbl. was reported for 4 cents. This is about 0.25 cent below what sellers had been getting for the material. No. 2 fuel was slightly firmer, one cargo being sold at 4 cents per barrel. This is 0.25 cent under top quotations, but just above the 3.875-cent price quoted on some material the previous week. Whether the price can be maintained is doubtful in view of the fact that most refiners are carrying large supplies of this material. Bunker C fuel is easier, and is quoted at 84 to 85 cents although no sales are reported.

Inquiries from spot market buyers were being received for the first time in several weeks on 72-74-octane gasoline, and while no sales were reported due to the acute transportation situation, the material could be bought for 0.25 cent under previous quotations.

REFINERY AND TANK-WAGON PRICES

(Prices as of February 10)

Refinery Gasoline

Octane (A.S.T.M.):	†80	78	74-76	72-74	68-70	63-66	60 & lower
Mid-Continent*				6.000-6.250		5.625-5.875	5.250-5.500
Pennsylvania		7.750-8.000	6.750-7.000				
Gulf Coast‡	6.00-6.50			§5.750-6.250	§5.750-6.250	§5.250-5.750	§5.000-5.500
Northeast Coast				8.300	8.300		
Pacific Coast		7.000-7.500		6.625-6.875		6.375-6.500	5.000-6.000

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. §Unleaded.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(375-390)
Oklahoma (Group 3)	3.500	3.875-4.000	
North Texas	3.250	3.500-3.625	
North Louisiana	3.375	3.625-3.750	
California			4.500-5.000

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*			4.500	4.375-4.625	
North Louisiana			4.375		
Pennsylvania	6.250	6.375			
California				4.500-6.000	4.500
Northeast Coast				5.300	
Gulf Coast				3.875	

*Basis Oklahoma Group 3.

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48°G.	24 D.I.	48-52 D.I.	58&above	Diesel bunkers	Bunker C
Mid-Continent*	4.125					
California		2.750-4.000				$0.85
Gulf Coast			4.000	4.125	$1.45	0.85
Northeast Coast				5.200	2.15	1.35
North Louisiana						†0.80-0.85

*Basis Oklahoma Group 3. †10-14° gravity.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.5	3.375	$0.85	$0.85
Pennsylvania (West)	5.625-6.000	5.125-5.500	†5.875	
Northeast Coast	5.2	5.2	1.65-75	1.35
Pacific Coast	5.5	5.5	‡0.85-95	$0.80
Gulf Coast	3.875-4.0		1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel oil. ‡Pacific specification 300. §Pacific specification 400.

Lubricating Oils

Bright and Steam Refined

OKLAHOMA (Group 3)—		
200-210 D, 10-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.50
Steam refined:		
600 dark green (untreated)	9.00	9.50
PENNSYLVANIA—		
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
630 flash	17.00	18.00

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.50
500-3½	20.50
600-3½	21.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.350-4.550
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.350-4.455
124-126 (A.m.p.) w.c. scale	4.350-4.455

Neutral Oil

CALIFORNIA—		
Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50
PENNSYLVANIA—		
150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		38.50
10 pour point		37.50
15 pour point		36.50
25 pour point		31.00
200 vis., at 70° F., 3 color:		
Zero pour point		40.50
10 pour point		39.50
15 pour point		38.50
25 pour point		33.00
NEW YORK—		
Wax in bags fully refined:		
130-132 (A.m.p.) wax		6.250
133-135 (A.m.p.) wax		6.550
Crude scale:		
124-126 (A.m.p.) w.s.	4.350-4.455	
124-126 (A.m.p.) y.s.	4.350-4.455	

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	72-74	68-70	65-66	60
Gulf Coast	6.500	6.250-6.500	5.875	5.625
Pacific Coast		6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene	Diesel fuel				Bunker
	41-43	24 G.	48-52 D.I.	58 D.I.	Bunkers	C grade
Gulf Coast	4.000-4.250		4.125-4.375	4.375	$1.65-80	$0.85-95
Pacific Coast	4.750-5.000	1.25-30			1.35-45	*0.85-90

*Pacific specification 400.

Lubricating Oils

	Neutral oils		Bright and cylinder stocks		
	200-3	150-3	200-3	150-3	600&630 S.R.
Mid-Continent	16.8		28.8	24.8	
Pennsylvania	43-50	41-46	36-37	36-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Baltimore, Md.	15.05	5.50	8.70
Boston, Mass.	14.00	4.50	8.00
Burlington, Vt.	16.00	5.50	...
Buffalo, N. Y.	15.30	5.50	8.30
Dover, Del.	15.80	5.50	10.50
Hartford, Conn.	14.70	4.50	...
Manchester, N. H.	16.40	5.50	9.00
Newark, N. J.	14.30	4.50	7.90
New York, N. Y.	15.20	5.50	8.00
Philadelphia, Pa.	15.30	5.50	10.15
Pittsburgh, Pa.	15.80	5.50	10.50
Portland, Me.	15.40	5.50	8.10
Providence, R. I.	14.10	4.50	7.80
Washington, D. C.	14.30	3.50	9.20
Average 14 cities	15.04	5.07	8.72

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Chicago, Ill.	14.10	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	11.90	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.25	8.00	8.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	15.00	7.00	8.00
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	14.90	5.57	9.44

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky and Louisiana)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Atlanta, Ga.	18.50	7.50	10.00
Birmingham, Ala.	19.00	8.50	9.00
Charleston, S. C.	18.05	7.50	...
Charleston, W. Va.	18.35	6.50	11.50
Charlotte, N. C.	19.20	7.50	9.50
Jacksonville, Fla.	18.50	8.50	8.00
Jackson, Miss.	18.00	7.50	9.00
Louisville, Ky.	17.00	6.50	8.50
Memphis, Tenn.	17.75	8.50	10.50
New Orleans, La.	17.75	8.50	*10.50
Norfolk, Va.	16.55	6.50	10.20
Average 11 cities	18.05	7.59	9.67

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.17	12.83
Average 50 cities	16.14	5.96	9,87
Average last week	16.03	5.96	9,80

WPB Takes Action to Curtail Use of Tin Cans

WASHINGTON, D. C.—Use of tin cans for the packaging of petroleum products was drastically curtailed last week by the War Production Board. In a telegram addressed to all can manufacturers, J. S. Knowlson, director of the Division of Industry Operations, ordered the manufacturers not to sell or deliver during February more than 50 per cent of the total quantity of tinplate cans and terneplate cans which were manufactured, sold, or delivered for packing petroleum during the same month in 1940.

"This is only a first step," Walter Shorter, chief of the Containers Branch, declared. "A general order regulating the manufacture of all tin cans is now being prepared and should be out shortly. This preliminary step is being taken to reduce at once the use of tin cans for products that can be packed in other containers."

Set Ceiling on Fuel-Oil Storage Tanks

WASHINGTON, D. C.—Maximum prices for domestic fuel-oil storage tanks, indispensable to domestic oil-burner installations, are established by Price Schedule 96, announced last Saturday by Leon Henderson, Administrator of the Office of Price Administration. The schedule becomes effective on February 20, 1942.

Ceiling prices apply to all sales of tanks in which the seller does not install the tank by connecting it with an oil burner.

Maximum prices for tanks delivered in the East are delivered prices and include lugs. Prices for tanks delivered in the Midwest and Far West are f.o.b. factory prices, and in the Far West include lugs.

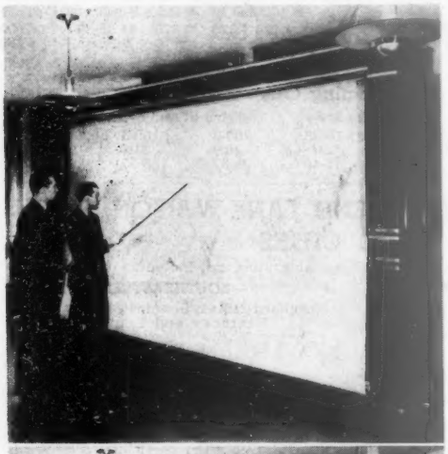
Typical prices for a carload shipment of 26-in., 16-gage steel, 275-gal. nominal capacity tank, are $17.35 in the East, $17.70 in the Midwest, and $31.95 in the Far West.

The schedule requires every manufacturer to affix to tanks produced by him durable labels setting forth the name of the manufacturer, the size and capacity of the tank and the gage of steel used. These labels will enable purchasers to compute the maximum prices applicable to all tanks.

EQUIPMENT PROGRESS...

Custom-Built Map Case Installed at Chicago

Pure Oil Co., Chicago, Ill., has recently installed one unit of the all metal, insulated and electrically controlled Model 37-A McCauley map case to house their



maps, which are 13 ft. wide and vary in length from 12 ft. to 20 ft.

This streamlined modern map case is constructed of metal throughout and it is 22 in. deep, 15 ft. 2 in. long and 9 ft. high. The case is constructed on sound mechanical and proven engineering principles. It is furnished complete with insulated storage compartment located in the bottom. The insulation is 2 in. of an approved insulating material on the top, front and back, 9 in. of air space at each end. The insulating material is assembled between two box-like sheet metal units welded and bolted together forming a compartment for the 8 in. storage roll on which the maps are wound and stored.

The front of the case is designed so it can be elevated to a horizontal position to form a drafting board. The top is covered with cork linoleum. It is 13 ft. 2 in. long by 24 in. wide, and can be raised to any desired elevation to accommodate either a sitting or standing position. It is insulated with 2 in. of insulation and incloses the front of the storage compartment.

The method of removing a map from the case is simple. It is accomplished by zipping the map selected from the other maps, and zipping the remaining maps together. This insures the operator continuous use of the maps remaining in the case. Maps zipped together can form a continuous display of 250 ft. of maps.

The Model-37-A Case is designed for electric or manual operation and can be furnished for either, or both methods. Operating controls are inclosed and protected by Yale locks. The Model 37-A McCauley Map Case is custom built by the Motors Metal Manufacturing Company of Detroit, Mich., so that colors and general dimensions may be specified to meet the requirements of the most discriminating purchaser.

Low-Visibility Paint Offered In Several Dull Shades

A new type of low-visibility paint, possessing exceptional heat deflecting qualities, has been developed by the Arco Co., Cleveland, Ohio, for use in the protective concealment of vital defense structures and equipment. Already in use on certain government properties, the new paint meets tentative Navy specifications for infrared reflecting paints for use on fuel-storage tanks, buildings, and certain types of equipment where dark colors as well as heat-reflecting qualities are required.

It has been offered commercially under the trade name, "Infray," and is being manufactured in green, tan, black, and four intermediate shades which, when properly selected, will meet the requirements of good camouflage in any sort of terrain. All seven shades are hard to see from the air and throw off most of the heat of the sun's rays that would normally be absorbed.

New Foundry Dedicated By Vapor Recovery Systems

The furnaces of the new Varec foundry of Vapor Recovery Systems Co., Compton, Calif., are now in full operation following the dedication ceremonies recently. In line with the expansion program initiated by Frank V. Long, president, the foundry is the fifth integral unit to be added in recent months. The warehouse, enlarged machine shop, welding and shipping units were completed early in October.

All Varec products, including tank equipment, gas control and safety devices, are now manufactured "under one roof," thus insuring Varec uniformity throughout.

Otis Tubing Safety Valve Is Protection Against Sabotage

The new importance of the tubing safety valve since the United States entered the war was the subject covered by John O. Farmer of Otis Pressure Control, Inc., Dallas, Tex., at the weekly meeting of the Dallas Petroleum Engineers Club, January 30.

The development of the safety valve was traced from the original "storm choke" used in coastal wells, to the present fully automatic Otis tubing safety valve. This valve is very much in demand to prevent wells from running wild in case of bombing or sabotage.

The positive, yet simple, operation of the two types was described. The difference between the velocity Type B and the pressure differential Type C, was clearly shown by use of slides. Mr. Farmer stated that production was now geared to meet the demands of the emergency and that all orders are being taken care of promptly.

TRADE LITERATURE

S. BLICKMAN, INC., 1400 Gregory Avenue, Weehawken, N. J.—"What to Look For when You Specify Stainless Steel for Your Processing Equipment," a booklet containing engineering data on fabrication and welding stainless steel, and the manufacturing and designing facilities of the organization.

DURALOY CO., Scottdale, Pa.—Bulletin 4227-C, describing Duraspun centrifugal castings of chrome-iron, chrome-nickel and nickel-chrome.

FISCHER & PORTER CO., 39 County Line Road, Hatboro, Pa.—Catalog Section 51-B, giving complete details on the recording-controlling rotameter for automatic control and permanent chart record of liquid or gas flow rates. The new device has all the advantages of the standard rotameter flow-rate instrument plus completely automatic flow control.

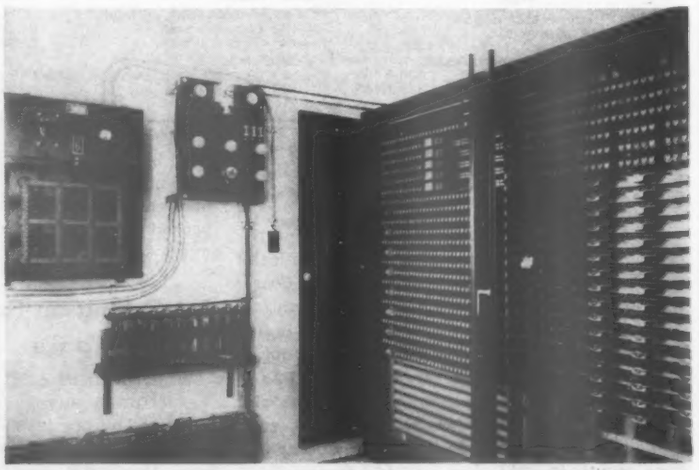
NORTON CO., Worcester, Mass.—"A Primer on Grinding Wheel Safety."

KELLOGG OFFERS COMMUNICATION SYSTEM FOR OIL FIELDS

The Kellogg Switchboard & Supply Co., 6650 South Cicero Avenue, Cicero, Ill., for many years has been working closely with the telegraph and telephone superintendents of the petroleum industry. As a result of this wide experience and understanding of the needs in this field, they have developed a dial-type intercommunication system that is particularly adaptable to the requirements of refineries, oil fields, and pipeline traffic. It closely ties together office, refinery, loading stations, and provides trouble-free operation 24 hours a day . . . with no attendants needed and practically no maintenance. Not only does it effect a saving in time and manpower, but it serves as a 24-hour alarm in case of emergency.

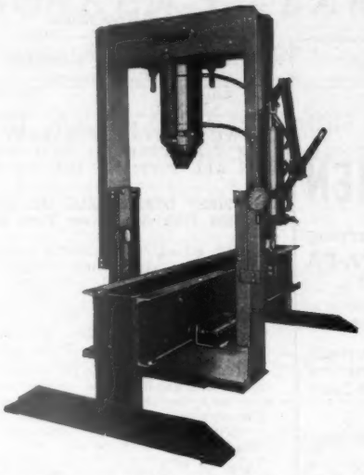
By the simple expedient of dialing one number, a series of other telephones can ring at any designated place, so that alarms can be sounded at any time of the day or night. In a few minutes fire equipment, ambulances, doctors, nurses, can be on the scene in time to save lives and property.

Illustrated is one of the switchboards . . . which is the "heart" of the Kellogg intercommunication system, controlling the telephones, signal devices, and all other component parts.



Movable Hydraulic Press Straightens Casing

Reclamation and conservation of bent, kinked, and distorted oil pipes up to 14 in. o.d. by .500-in. wall is now made possible with a new 125-ton hydraulic press straightener and special tool equipment, manufactured by the Bee-Line Co. of Davenport, Iowa.



The press is mounted on a movable roller-bearing carriage which permits application of pressure at any point in an 84 in. by 34-in. bed. The jack carriage can be raised or lowered 16 in. with a minimum space between the ram and the bed of 2 in. and a maximum space of 28 in. The ram travel is 10 in. The jack features three speeds—high, medium, and low. Over-all dimensions of the complete press are: Length 8 ft., width 4 ft. 8 in., weight 4,000 lb.

Conservative estimates have been made that two men can reclaim enough casing within a few weeks' time to actually pay for the initial investment on the press.

Complete Line of Blackout Materials Announced by Carey

The Philip Carey Manufacturing Co., Lockland, Cincinnati, Ohio, has made extensive study of the problems arising from air raids and has developed a blackout material to meet the various requirements involved. Foremost problems are to: (1) Prevent reflection of outside light on windows and (2) provide protection from flying glass.

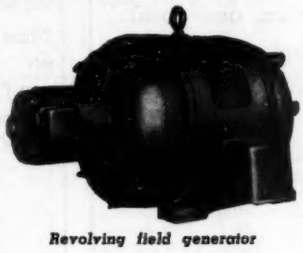
To prevent reflected light from revealing a target, Carey provides a blackout coating which is said to be nonreflective and to insure complete light stoppage with one coat. This coating is applied as a paint and is recommended for either inside or outside application, but is particularly desirable for preventing light reflection on the outside surface of skylights.

To lessen the danger from flying glass any one of three types of Carey blackout board is recommended by the manufacturer for application to the inside of windows. They are of good rigidity, moisture and condensationproof, easily installed and quickly removable.

The company also offers the Carey laminated system for more permanent weatherproof blackout treatment; emergency blackout paper to cover broken windows, and the Rejuvo system of camouflage.

New Generators Adaptable To Load Fluctuations

Century Electric Co., 1806 Pine Street, St. Louis, Mo., now offers new, compact, streamlined, revolving field, alternating-current generators. These generators are available in sizes from 7½ to 75 kva.—4. 6, or 8-pole. 1,800, 1,200, or 900 r.p.m. 60-cycle (corresponding speeds for other frequencies) for belt or coupling drive or flange mounting. They are offered for continuous duty in isolated plants, or to supplement other available power supply.



Revolving field generator

These new generators are wound for the various standard voltages—single phase 2 and 3-wire, three phase 3 and 4-wire, or two phase 4-wire. The neutral may be brought out for three phase 4-wire systems for light and power.

They are built to meet A.I.E.E. and N.E.M.A. voltage regulation standards. An automatic voltage regulator is generally used for best lighting service where the load fluctuates through a wide range. They can be designed for any desired value of power factor, but the regulation will be governed by the power factor.

Oakite Expands Facilities To Meet Demand for Service

To better meet the rapidly increased needs for its services and products in New England and the Southwest, Oakite Products, Inc., 48 Thames Street, New York, N. Y., manufacturers of industrial cleaning materials since 1909, has announced the addition of two newly created divisions to its nation-wide field service staff, effective January 1.

S. C. SHANK

T. R. SMITH

The New England division, with headquarters in Hartford, Conn., is headed by T. R. Smith, division manager, who will be assisted by a staff of 11. The second new Oakite division is the St. Louis and southwestern division, which will make its headquarters in St. Louis. S. C. Shank has been named division manager and will direct the activities of the 12 men of this division.

Both newly appointed division managers bring to their new posts a wealth of knowledge and experience in the many essential cleaning operations required in the petroleum industry. Mr. Smith has served for the past 16 years as an Oakite service representative in a major eastern industrial area while Mr. Shank has covered a midwestern territory since 1930.

Department Sales Manager Appointed by General Electric

The appointment of W. A. Wirene as assistant sales manager of the petroleum, chemical, mining, and steel mill section of the General Electric industrial department has been announced by J. E. N. Hume, G-E commercial vice president.

A native of Columbia, Iowa, Mr. Wirene was graduated from Iowa State College in 1925 with a bachelor of science degree in electrical engineering. In August of 1925 he joined General Electric as a student engineer on the company's test course at Schenectady.

Early in 1927 he became a salesman's assistant in the industrial department of the company's Chicago office, and later in that year became a salesman in the Kansas City, Mo., office. In July 1940, Mr. Wirene returned to Schenectady as sales engineer of the petroleum and chemical section of the G-E industrial department, the position he held until his recent promotion.

AMONG EQUIPMENT MEN...

War Effort Results in New Allis-Chalmers Department

Walter Geist, vice president of the Allis-Chalmers Co., Milwaukee, Wis., is to head a new department established to coordinate the company's sales policies, according to an announcement by W. C. Buchanan, president.

WALTER GEIST

"The matters of sales and sales organization have become very complex because of the company's all-out war effort which puts practically its entire productive capacity at the disposal of the Army, Navy, Air Corps, and the vast number of manufacturers producing material vital to our war efforts," said Mr. Buchanan, "and the resulting problems make necessary this new centralized sales administrative department."

The duties of this department will be not only to formulate and put into effect sales policies, but also to correlate and unify the selling activities for all the company's 1,600 products, with the exception of those of the tractor department.

Johns-Manville Research Head Becomes Vice President

Dr. C. F. Rassweiler, who joined Johns-Manville last June as director of research, was appointed a vice president of Johns-Manville Corp., according to an announcement by Lewis H. Brown, president.

In his new office, Dr. Rassweiler will continue in charge of the company's research and development activities which are now largely devoted to converting the full production capacity of Johns-Manville to war uses. Intensive studies of new products and entirely new business possibilities for J-M which may be introduced to create additional employment and sales after the war is over, are also being conducted.

Johns-Manville's research laboratories are located in Manville, N. J., and are managed by E. R. Williams, who will continue in that capacity.

Wickwire Spencer Appoints Plant Protection Engineer

E. C. Bowers, president of Wickwire Spencer Steel Co., announced the appointment of John A. Bigelow as plant protection engineer. Before joining Wickwire Spencer, Mr. Bigelow represented a branch of the graphic arts serving a variety of industrial accounts.

Mr. Bigelow will supervise protection of the company's seven plants located in Buffalo, N. Y.; Worcester, Clinton, and Palmer, Mass.; Mount Wolf, Pa., and Blue Island, Ill., including the maintenance of employment records and employe identification.

BUSINESS NOTES

The Missouri-Illinois Tractor & Equipment Co., Inc., of 510 Withers Avenue, St. Louis, Mo., has been appointed distributor for Bucyrus-Erie ⅝-yd. to 2½-yd. shovels, draglines, clamshell, and lifting cranes. Its territory includes southwestern Illinois and eastern Missouri.

The Youngstown Sheet & Tube Co. has announced the appointment of F. D. Carroll as district sales manager of its Dallas territory with headquarters at 610 Continental Building, Dallas, Tex.

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Box 451, Center, Texas

FOR SALE: Substantial interest in production Artesia, Eddy County, New Mexico Fields. Box A-873, The Oil and Gas Journal, Tulsa, Oklahoma.

WE HAVE mineral and oil royalties on 4,000 acres of land in Oklahoma. Would like to lease this to a driller. If interested, write the ALTO OIL AND INVESTMENT COMPANY, CHEROKEE, IOWA.

FOR SALE: 40 Bbl. Daily Oil Production, $40,000. Will trade ⅛ interest for Spudder & Tools, equal to $5,000 value. Box A-872, The Oil and Gas Journal, Tulsa, Okla.

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Situations Wanted

CAPABLE refinery superintendent now employed desires change. Experience includes construction and operations. Details discussed in correspondence or interview. Box A-861, The Oil and Gas Journal, Tulsa, Okla.

PETROLEUM and PRODUCTION ENGINEER; age 29; seven years with major oil company, four years as district head. Forced to terminate present private business venture due to shortage of materials. Desire connection with a progressive oil company in need of an experienced engineer. Box A-851, The Oil and Gas Journal. Tulsa, Okla.

LEASEMAN experienced in assembling wildcat blocks Georgia, Florida, Alabama and Mississippi, will work on salary and expenses, or will take interest in blocks you pay expenses. Best references. Address P. O. Box 27, Ozark, Alabama.

PETROLEUM and Natural Gas Engineer, experienced in production schedules, costs, equipment design, inspection, purchasing, technical and legal investigations. Widely traveled, good contact man. Box A-831, The Oil and Gas Journal, Tulsa, Okla.

REFINERY SUPERINTENDENT, graduate Engineer, 20 yrs. experience. Now employed by large Engineering firm, desires position as Superintendent or Chief Engineer. Best of references. Box A-871, The Oil and Gas Journal, Tulsa, Okla.

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Application should be made by letter, giving age, nationality, concise outline of previous business experience and educational background, present salary, salary desired, and references. Include recent photograph. Ernest Owen, E. B. BADGER & SONS COMPANY, 75 Pitts St., Boston, Mass.

COMPETENT man for Land Department position responsible oil company, one not likely to be drafted who is thoroughly experienced and trained handling title requirements, rentals, division orders, maps and office records. Typist preferred. Do not apply unless experienced in handling Texas and Louisiana titles. Answer care P. O. Box 670, Fort Worth, Texas.

REFINERY ENGINEER—For estimating, processing work, preliminary design, engineering reports, general plant engineering. Midwest refinery. Box A-870, The Oil and Gas Journal, Tulsa, Okla.

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INQUIRIES invited to buy or sell producing royalties, Illinois preferable. J. A. Wolf, 407 S. Dearborn St., Chicago, Ill.

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Mailing Lists

ROYALTY owners, Oil investors, Unit holders, Stockholders, Operating personnel of oil industry. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa, Okla.

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Nathan Pipe & Supply Co., Inc.
Overton, Texas.

TWO Murphy Diesel Engines 150 HP. each slightly used, excellent condition. For Sale f.o.b. Houston. 525 Waggoner Bldg., Wichita Falls, Texas.

FOR SALE
3—72" x 30' 15 tray Southwestern Engineering Co. Absorbers, 60# working pressure.
1—60" x 30' 15 tray Southwestern Engineering Co. Absorber, 75# working pressure.
1—30" x 34' 15 tray Absorber, Tulsa Type, 300# working pressure.
W. S. SMITH
523 Thompson Bldg., Tulsa, Okla.

OKLAHOMA CITY alloyed
once run ⅞ & 1" sucker rods
MIKE TRAVIS, 1702 S. Boulder,
Phone 2-2447. Tulsa, Okla.

FOR SALE at Bartlesville: 1 model 1312 photostat machine. Complete $750. Patridge, Cities Service Oil Co., Bartlesville, Okla.

WANTED—Used Oil Country boilers. Write us giving complete specifications, condition and location. Lucey Products Corp., Tulsa, Okla.

FOR SALE: Wilson-Mogul Drawworks with water cooled brakes and 100 H.P. International Motor. Melton Supply Co., Seminole, Oklahoma.

TRACTORS

Caterpillar, crawler type, size "35" $495; size "65" with nigger head winch $895; Austin Western hydraulic grader 10' blade $650. O. C. Evans, Mt. Sterling, Kentucky

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FOR SALE: 6 x 16 Wilson-Snyder Power Slush Pump. Melton Supply Co., Seminole, Okla.

FOR SALE near Wewoka, Oklahoma: 2—80 H.P. Type V Foos Gas Engines complete in good operating condition. Patridge, Cities Service Oil, Bartlesville, Okla.

1—3" Worthington Rotary Pump with Model XAHU Waukesha Engine on steel skids—Price $650.
1—2½" Worthington Rotary Pump with Model 217 Buda Engine on skids—Price $650.
Lot of No. 1 secondhand 3" line pipe—Price 30c per foot.
Lot of 3", 4" and 6" fittings at 75% of new prices.
AMERLAGENE, Inc.
First National Bank Building
Shreveport, Louisiana.

3—STANDARD Rig Pumping Assemblies for sale—consisting of:
2—21 HP Reid Engines
1—Oil Well Black Bear 25 HP
1—Moore tubular derrick
2—72' Angle iron derricks
Rig irons, sand reels and reversible clutches.
Located Coleman County, Texas.
A. W. ADKISSON
W. T. Waggoner Bldg., Ft. Worth, Texas.

FOR SALE
2—480-240 Southwestern Engineering Co., gas coolers, low pressure.
2—240 square ft. Southwestern Engineering Co., gas coolers, high pressure.
W. S. SMITH
523 Thompson Bldg., Tulsa, Okla.

FOR SALE at Bartlesville: 15 oak drafting tables, $35 each. Patridge, Cities Service Oil Co., Bartlesville, Okla.

IMPROVED N Sullivan Core Drill, good condition; priced to sell. Healdton Machine Tool Co., Healdton, Okla.

GAS ENGINES AND COMPRESSORS
FROM
RODESSA REFINERY, SHREVEPORT, LA.

1—Bessemer gas compressor, 80 HP, type 8, 180 RPM, 16 x 20 engine cylinder, 12 x 20 air cylinder, opposed type, double fly wheel, complete with full automatic forced feed lubrication, latest type governor, and magneto. Serial No. 20746.

3—Bessemer gas compressors, 80 HP, type 8, four valve, 6¼ x 20 compressor cylinder, 16 x 20 engine cylinder, Max. working pressure 1,000 PSI, opposed type, complete with full automatic forced feed lubrication, latest type governor, and magneto.

1—Bessemer gas engine, 110 HP, 180 RPM, 2 cylinder horizontal, Serial No. 16490, double fly wheel, with full automatic forced feed lubrication and magneto.

2—Bessemer gas engines, 165 HP, 180 RPM, 2 cylinder horizontal, double fly wheel, with full automatic forced feed lubrication and magneto.

All in Good Condition and Priced for Immediate Sale

BROWN-STRAUSS CORPORATION

At (Cedar Grove) Shreveport, La.
Phone 7-7334
Leonard H. Strauss, Resident Engineer

Main Office: Kansas City, Mo.
LD. Phone 169
Harry B. Strauss, Manager

FOR SALE: 3—100 H.P. Clark Engines with direct connected compressors. Can be used for Drilling Engines. 190 H.P. Miller Gas Engine direct connected compressors. Triplex and Duplex Pumps. A. C. Askew, Box 3073, Whittier Sta., Tulsa, Okla.

FOR SALE: 125 H.P. 200 W.P. Brou erick Boiler, Code Condition, $975. Melton Supply Co., Seminole, Okla.

FOR SALE

20,000' 12¾" O.D. lapweld pipe.
5,000' 7", 24 lb. seamless casing.
5,000' 2½" seamless upset tubing.
300 sets 3" tool joints, full hole.
200 sets 3" full hole tool joints.
Both steam and power drilling rig. A complete line of drilling and pumping equipment.
Wire, write, or phone the

Louisiana Iron & Supply Company
Shreveport, Louisiana

FOR SALE: BRAND NEW WESTFALIA OIL PURIFIERS & BENZINE CLARIFIERS, Never used:

3—Model OKE Oil, Cap. 75 Gal. Hr. M.D.
2—Model 0-10 Oil, Cap. 165 Gal. Hr. B.D.
2—Model OM-10 Oil, Cap. 165 Gal. Hr. M.D.
1—Model BFK Benzine, Cap. 700 Gal. Hr. B.D.
2—Model BHK Benzine, Cap. 1500 Gal. Hr B.D.
CONSUMERS MACHINERY EXCHANGE, INC.—BOULevard 4421
146-152 West Root Street, Chicago, Ill.

FOR SALE
Located one-half mile south of Shidler, Oklahoma.
3—190 HP. Type 3, New Watts-Miller twin gas engines, complete, with two-stage compressors, direct connected.
2—190 HP. Type 3, New Watts-Miller twin gas engines, complete, with single-stage compressors, direct connected.
3—190 HP. Type 3, New Watts-Miller twin gas engines, not complete.
2—70 HP. New Watts-Miller, Overhead belt-driven auxiliary engines.
Large quantity of new, unused extra parts for 190 HP. New Watts-Miller Engines and Compressors; bearings, pistons, rings, valves, etc.
1—steel building, 222' long x 32' wide.
1—steel auxiliary building, 30' x 32' wide. Both buildings are braced with 6" I-beams.
A number of steel buildings with wood frames.
Large stock of fittings, from 2" including 16", mostly screw.
6,000—8⅝" Dresser sleeve couplings, less bolts and rubbers.
2—size #6 and 1—size #3 A. C. Cemron Centrifugal Pumps.
1,000' of mesh wire fencing, with barbed wire extensions on top.
2—75 HP. Chicago Pneumatic Engines and Compressors, located near Wewoka, Oklahoma.
If interested, please write
KAHAN PIPE & SUPPLY CO.
P. O. Box 682, Tulsa, Oklahoma
or call 4-6537, Tulsa, Oklahoma.

FOR SALE
MARINE TYPE BOILERS

2—SCOTCH MARINE 180 HP 150# W.P. Boilers complete with Dutch oven, steel building, fire brick, all header connections and stack. In first class condition.

Louisiana Iron & Supply Co.
Longview, Texas

FOR SALE at Oklahoma City: 1—100 H.P. Kewanee 200# W.P. oil field type boiler. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE
1—Complete Std. drilling rig consisting of:
1—122' Emsco Angle Iron Derrick with 5" re-legs, Steel band wheel, steel bull wheel, steel calf wheel, Parkersburg sand reel.
1—Steel front with steel walking beam.
1—13¼ x 16 Reid twin diesel engine with OCS Jack shaft and clutch mounted on skids.
Above in first class condition having drilled but one well 6500' deep.
Also 1—122' angle iron used Lee C. Moore steel derrick.
FT. WORTH PIPE & SUPPLY CO.
Ft. Worth, Tex., Phone 2-1204.

FOR SALE at Oklahoma City -:- 1—1930 "35" Allis-Chalmers Crawler Tractor, $400.00. Patridge, Cities Service Oil, Bartlesville, Okla.

FOR SALE: International Diesel Motor U.D.-18. Almost new, complete with outboard bearing, pulley and belts. Adair-Morton Company, Wichita, Kansas.

FOR SALE: Surplus equipment, 4 Star Drilling Machines—4 Pipe Threading Machines. Also second-hand pipe, casing and oil and gas well supplies. Lee Morrison Supply Co., Bartlesville, Okla. Tulsa Representative phone 4-3355.

FOR SALE
OIL STORAGE TANKS

3—55,000 Bbl.
1—25,000 Bbl.
5—10,000 Bbl.
3— 5,000 Bbl.
4— 2,500 Bbl.
1— 1,000 Bbl.
2— 750 Bbl.
2— 600 Bbl.
2— 1,200 Bbl. Agitators.

Can be inspected at
Middlesex Refinery Co.
Raritan, N. J.

Address your inquiries to

DULIEN STEEL PRODUCTS, INC.
2280 Woolworth Bldg.
New York, N. Y.
Tele—Cort. 7-4676

LUMP close-out of Oil Field Transmission. Write for items and price. C. M. Baker, Waterloo, Iowa.

FOR SALE: Dayton-Dowd 6" x 8" Centrifugal with 30 hp., 220 volt motor, 1000 gpm., 90 ft. Deep Well Turbine, 60 gpm., 270 ft. with motor or belt drive. Worthington 4" high pressure rotary. Two belt driven two stage air compressors 340 ft. and 368 ft. at 120 pounds. Bruce-McBeth engine driven 50 KW., 220 volt generator with exciter. 9" x 10" Vertical Single acting triplex plunger pump.
CORKEN PUMP & MACHINERY CO.
206 E. Grand Ave., Oklahoma City, Okla.

FOR SALE: 1 set of pipe stock and dies with ratchets complete. 2-inch to 4-inch inclusive. Charlie Harman, 1322 Indianola St., Bowling Green, Kentucky.

FOR SALE: 1 Motor driven rotary drilling rig; suitable for 6,000 ft. work. Melton Supply Co., Seminole, Oklahoma.

Equipment Wanted

HIGHEST cash prices paid for entire plants or individual production tools, milling machines, shapers, drill-presses, lathes, punch presses, electrical equipment and motors. Write us and a representative will call. COOK COUNTY MACHINERY CO., 1132 W. Lake St., Chicago, Ill.

3,000 TO 5,000 barrel used riveted, or welded, steel tank. Rush complete information to Milan Refining Company, P. O. Box 656, Milan, Illinois.

Wanted

WANTED: Proven Oil production deals $100,000 or more, no brokers.
M. R. TRAVIS
1702 S. Boulder, Ph. 2-2447, Tulsa, Okla.

CRUDE OIL WANTED—Cash paid for crude oil from Oklahoma, Kansas, North Texas, Illinois, and Wyoming. Give amount available per day, field, pipeline connections, distance from pipe lines or railroads, formation, complete specifications, and price in first letter. Box A-844, The Oil and Gas Journal, Tulsa, Okla.

Journalisms:

SEVERAL months ago the Journal published a very interesting article on the application of flow valves to gas-lift operations. (Practical Application of Flow-Valve Installation Principles, by James E. Halferty, Nov. 27, 1941, p. 46.) In it the author summarized the basic principles of this method of lifting oil and discussed the open-type systems.

This article elicited numerous comments from engineers and many expressed a desire for supplementary material on closed installations.

In next week's issue, Mr. Halferty obliges with another piece on gas lift, "Basic Principles of Closed Type Flow-Valve Installations." He also discusses the effect of the ratio of the casing annular area to the internal tubing area on the submergence and spacing of the flow valves. Taken together, the two articles give a complete picture of gas-lift operation.

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FROM a producing standpoint, one of the major annoyances is the clogging of tubing and flow lines with paraffin. Many engineers have worked on this problem and numerous devices have been designed to combat the trouble. Several of the outstanding methods have been discussed at various times in the Journal pages.

One of the most effective methods introduced in the past several years uses steam to melt the paraffin and allow it to be pumped from the tubing and flow lines. It is being used in the East Texas field with success and economy. In next week's issue, T. P. Sanders, associate editor of the Journal, will describe the method and the equipment used.

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THERE are many short cuts introduced by engineers and superintendents in the field which save time and money. The staff of The Oil and Gas Journal hunt these out for they know field men can use them in their work. Many of these ideas and methods are shown pictorially on the weekly Operating Ideas page or are described in short articles.

Next week an interesting short will tell how a field engineer, on a repressure project, took inexpensive slide rules and remodeled them with a penknife so the pumpers and production men could calculate the volume of gas produced with the oil.

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THOMAS M. GALEY, an operator of Owensboro, Ky., sends us a copy of a letter he has written to James E. Hughes, priorities consultant, WPB, in which he protests the "unclear English used in oil legislation." He suggests that we write an editorial commenting on the absurdities that sometimes find their way into legislation, and calling attention to ambiguities and lack of explicit meaning in the language. In commenting on the Journal's editorial feature, "Views for Victory," Mr. Galey tells us he "is struck with the timidity of those called upon to write their impressions. Only a few talk out boldly," he adds.

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CALENDAR

February

INDUSTRIAL SAFETY SECTION, fourth annual safety conference, Roosevelt Hotel, New Orleans La., February 22-24.

AMERICAN PETROLEUM INSTITUTE, Division of Production, southwestern district, spring meeting, Adolphus Hotel, Dallas, Tex., February 26-27.

NORTH TEXAS OIL AND GAS ASSOCIATION, Wichita Falls, Tex., February 28.

March

AMERICAN SOCIETY FOR TESTING MATERIALS, committee week and spring meeting, Cleveland, Ohio, March 2-5.

INDIANA INDEPENDENT PETROLEUM ASSOCIATION, spring convention and refiners and suppliers exhibit, Hotel Severin, Indianapolis, Ind., March 3-5.

AMERICAN PETROLEUM INSTITUTE, division of production, Pacific Coast district, spring meeting, Biltmore Hotel, Los Angeles, Calif., March 10.

WISCONSIN PETROLEUM ASSOCIATION, annual convention and equipment show, Schroeder Hotel, Milwaukee, Wis., March 18-20.

OKLAHOMA UTILITIES ASSOCIATION, annual convention, Biltmore Hotel, Oklahoma City, Okla., March 23-24.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, spring meeting, Houston, Tex., March 23-25.

AMERICAN PETROLEUM INSTITUTE, division of production, Mid-Continent district, Mayo Hotel, Tulsa, March 26-27.

April

AMERICAN PETROLEUM INSTITUTE, eastern district, Division of Production, William Penn Hotel, Pittsburgh, Pa., April 9-10.

MIDWEST POWER CONFERENCE, annual meeting, Palmer House, Chicago, Ill., April 9-10.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Cincinnati, Ohio, April 15-17.

NATIONAL PETROLEUM ASSOCIATION, thirty-ninth semiannual meeting, Cleveland, Ohio, April 16-17, 1942.

AMERICAN CHEMICAL SOCIETY, 103rd meeting, Memphis, Tenn., April 20-24.

SOUTHWESTERN GAS-MEASUREMENT SHORT COURSE, Norman, Okla., April 21-23.

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, twenty-seventh annual meeting, Cosmopolitan Hotel, Denver, Colo., April 21-24.

PETROLEUM INDUSTRY ELECTRICAL ASSOCIATION, Washington-Youree Hotel, Shreveport, La., April 22-24.

May

AMERICAN GAS ASSOCIATION, thirty-seventh annual natural-gas convention, New Orleans, La., May 4-7.

NATURAL GASOLINE ASSOCIATION OF AMERICA, Mayo Hotel, May 13-15.

AMERICAN PETROLEUM INSTITUTE, midyear meeting, Oklahoma Biltmore Hotel, Oklahoma City, Okla., May 25-28.

NATIONAL ASSOCIATION OF PURCHASING AGENTS (oil-company buyers' group), Waldorf-Astoria Hotel, New York City, May 25-28.

June

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, semiannual meeting, Cleveland, Ohio, June 8-11.

AMERICAN SOCIETY OF TESTING MATERIALS, Chalfonte-Haddon Hall, Atlantic City, N. J., June 22-26.

October

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, fall meeting, Rochester, N. Y., October 12-14.

AMERICAN PETROLEUM INSTITUTE, twenty-third annual meeting, Stevens Hotel, Chicago, Ill., November 9-13.

December

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, annual meeting, New York City, November 30-December 4.